

**SAN ANTONIO WATER SYSTEM
NACO PUMP STATION IMPROVEMENTS PROJECT
SAWS PROJECT NO. 12-6003
SOLICITATION NO. B-14-005-DD
ADDENDUM NO. 3**

February 20, 2014

This addendum, applicable to work designated above, is an amendment to the proposal and specification documents and as such shall be a part of and included in the Contract. Acknowledge receipt of this addendum by entering the addendum number and issue date in the spaces provided on all submitted copies of the proposal.

1.0 Addenda Purpose

The purpose of this addendum is to issue a revision to the Contract Documents, plans and specifications for the Naco Pump Station Improvements Project (SAWS Job No. 12-6003).

2.0 Modifications to Part I – CONTRACT DOCUMENTS

- A. PRICE PROPOSAL – DELETE the Price Proposal in its entirety and REPLACE with the Price Proposal provided in Addendum No. 3.
- B. INSERT the Texas Water Development Board Form SRF-404, provided in this Addendum No. 3 into the CONTRACT DOCUMENTS.
- C. SUPPLEMENTARY INSTRUCTIONS TO RESPONDENTS – Article C(1)(f). DELETE and REPLACE the first sentence with the following:

“Provide experience of the CONSTRUCTION TEAM as it relates to the constructing of at least three (3) potable water pump stations within the last ten (10) years with a minimum total design output of fifteen (15) MGD each, involving the installation of above and below ground station piping with a minimum of 24-inch diameter, as well as the installation of 4,160 voltage motor control centers with at least four (4) motor starters.”

- D. SPECIAL CONDITIONS. ADD the following paragraph:

5.0 Construction Trailer and Laydown Area: SAWS Lot 45 located immediately adjacent to the Northeast Service Center can be used for the Contractor’s laydown area. See hatched area in the enclosed site map at the end of this addendum. However, Contractor shall not be allowed to remove any trees or place any materials in the 100-year floodplain. In addition, the Contractor must maintain this Lot 45 clean throughout the entire construction duration by mowing the grass and collecting trash, etc. Lot 45 must be restored to its original or better condition following the specifications under Division 2 including, but not limited to, Soil Preparation, Vegetation Restoration, etc. Site security shall be maintained

at the Contractor's expense. Contractor shall use Nacogdoches Road entrance gate to access Naco Pump Station throughout construction. Access through the SAWS Northeast Service Center entrance gate shall not be allowed."

ADD the attached SAWS Daily Construction Report form to the end of this section.

3.0 Modifications to Part II – TECHNICAL SPECIFICATIONS

- A. TABLE OF CONTENTS – ADD the following specification sections to the Table of Contents, Part II Technical Specifications, Division 2 – Site Work:

02360	Vegetation Restoration
02481	Tree and Landscape Protection

- B. SECTION 01270 MEASUREMENT AND PAYMENT – Article 1.04(E)(2). DELETE and REPLACE with the following:

"Measurement – Measurement of the item "CPS Energy Allowance" will be by lump sum and shall not exceed \$30,000.00."

- C. SECTION 01400 QUALITY CONTROL – Article 1.02(D)(1)(e)(v). ADD the following to the end of this section:

"(g) Provide qualifications for all testing personnel, including ACI certifications."

- D. SECTION 02200 EARTH EXCAVATION, BACKFILL, FILL AND GRADING – Article 1.01. ADD the following:

"H. Refer to Section 13205 for excavation and backfill requirements associated with the proposed ground storage tank."

- E. SECTION 02360 VEGETATION RESTORATION – ADD the following specification.

- F. SECTION 02481 TREE AND LANDSCAPE PROTECTION – ADD the following specification.

- G. SECTION 02615 DUCTILE IRON PIPE AND FITTINGS – Article 2.04(F). DELETE the fourth sentence and REPLACE with the following:

"Coating shall be Xylan® (as manufactured by Whitford Corporation), Cor-Blue (as manufactured by NSS Industries), or approved equal."

- H. SECTION 02617 STEEL PIPE – Article 2.02(A)(1)(b)(i). DELETE and REPLACE with the following:

"i. Working Pressure = 200 psi minimum for all piping."

- I. SECTION 02617 STEEL PIPE – Article 2.02(A)(1)(b)(ii). DELETE and REPLACE with the following:

“ii. Surge Allowance = 50 psi minimum. Total Pressure = Working Pressure + Surge Allowance.”

- J. SECTION 02617 STEEL PIPE – Article 2.02(B)(3). DELETE the last sentence and REPLACE with the following:

“Flanges shall be Class E in accordance with AWWA C207 and drilled in accordance with ANSI B16.1 Class 125.”

- K. SECTION 02910 SOIL PREPARATION – DELETE this section in its entirety and REPLACE with the attached Specification Section 02910 Soil Preparation.

- L. SECTION 03300 CAST-IN-PLACE CONCRETE – Article 3.18. DELETE the “18” x 48” Girders” row of boxes and REPLACE with the following:

18” x 48” Girders	5,000 psi	3/4”	White Curing Compound
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- M. SECTION 11211 HORIZONTAL SPLIT-CASE CENTRIFUGAL PUMPS – Article 2.03(A). DELETE the “Maximum Nominal Pump Speed” row of boxes and REPLACE with the following:

Maximum Nominal Pump Speed	1,800 rpm
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- N. SECTION 11211 HORIZONTAL SPLIT-CASE CENTRIFUGAL PUMPS – Article 2.03(A). ADD the following row of boxes:

Maximum NPSHr at Runout	28.8 feet
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- O. SECTION 11211 HORIZONTAL SPLIT-CASE CENTRIFUGAL PUMPS – Article 2.03(B). ADD the following row of boxes:

Maximum NPSHr at Runout	31.4 feet
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- P. SECTION 11242 CHEMICAL FEED SYSTEMS AND EQUIPMENT– Paragraph 2.01.A – ADD “Periflo Pumps by Pulsafeeder Engineered Products, Rochester, NY;” as an approved pump manufacturer before the phrase “or Engineer approved equal”.

- Q. SECTION 13205 PRECAST, PRESTRESSED CONCRETE TANK WITH STEEL DIAPHRAGM – Article 2.01(B)(6). DELETE and REPLACE with the following:

“6. Seismic loads shall be based on ACI 350.3 with an ASCE 7 Site Class of D, a short period acceleration (S_s) of 0.104g, a 1-second (S_1) acceleration of 0.031g and an importance factor of 1.25.”

- R. SECTION 15088 FLEXIBLE JOINTS AND COUPLINGS – Article 2.01(A)(1)(a). DELETE and REPLACE with the following:

“a. Working Pressure = 200 psi minimum for all piping.”

- S. SECTION 15088 FLEXIBLE JOINTS AND COUPLINGS – Article 2.01(A)(1)(b). DELETE in its entirety.

- T. SECTION 15088 FLEXIBLE JOINTS AND COUPLINGS – Article 2.01(A)(1)(c). DELETE and REPLACE with the following:

“c. Surge Allowance = 50 psi minimum. Total Pressure = Working Pressure + Surge Allowance.”

- U. SECTION 15088 FLEXIBLE JOINTS AND COUPLINGS – Article 2.01(D). DELETE and REPLACE with the following:

“D. Flanges shall be Class E in accordance with AWWA C207.”

- V. SECTION 15088 FLEXIBLE JOINTS AND COUPLINGS – Article 2.02(A)(1)(a). DELETE and REPLACE with the following:

“a. Working Pressure = 200 psi minimum for all piping.”

- W. SECTION 15088 FLEXIBLE JOINTS AND COUPLINGS – Article 2.02(A)(1)(b). DELETE in its entirety.

- X. SECTION 15088 FLEXIBLE JOINTS AND COUPLINGS – Article 2.02(A)(1)(c). DELETE and REPLACE with the following:

“c. Surge Allowance = 50 psi minimum. Total Pressure = Working Pressure + Surge Allowance.”

- Y. SECTION 15088 FLEXIBLE JOINTS AND COUPLINGS – Article 2.02(B). DELETE and REPLACE with the following:

i. “B. Flanges shall be Class E in accordance with AWWA C207.”

- Z. SECTION 15090 BALL VALVES AND ELECTRIC ACTUATORS – Article 2.01(H). DELETE and REPLACE with the following:

“H. All ball valves shall be coated with either 1) a fusion bonded epoxy coating, 25 mils minimum dry film thickness, or 2) a two-part epoxy coating system with a minimum dry film thickness of 10-12 mils. Refer to Section 09902 for full coating system requirements.

AA. SECTION 15092 BUTTERFLY VALVES – Article 2.01(H). DELETE and REPLACE with the following:

“H. All butterfly valves shall be coated with either 1) a fusion bonded epoxy coating, 25 mils minimum dry film thickness, or 2) a two-part epoxy coating system with a minimum dry film thickness of 10-12 mils. Refer to Section 09902 for full coating system requirements.

BB. SECTION 16110 – RACEWAYS – Article 2.03 C: ADD the following:

1. “3. All rigid galvanized conduit shall be wrapped where in contact with concrete and/or soil. Wrap conduits 6” above contact point with soil and/or concrete.”

CC. SECTION 16110 – RACEWAYS – Article 3.05 C: ADD the following:

1. “Wrap rigid steel conduit per section 2.03 C.”

DD. SECTION 17515 – COMMUNICATIONS INTERFACE EQUIPMENT – Article 2.05 B: REMOVE existing list and REPLACE with the following:

<u>DESCRIPTION</u>	<u>MANUFACTURER</u>	<u>PART NUMBER</u>	<u>QUANTITY</u>
Explore Air - Radio 11.2-11.4 GHZ	Exalt	E11E741-0490H1	1
Explore Air - Radio 10.7-10.9 GHZ	Exalt	E11E741-0490L1	1
Explore Air - AC Power Kit, Single Terminal	Exalt	A204789	2
Explore Air - Upgrade Key 100 to 500 Mbps	Exalt	K03BXXXX41	2
3-year Warranty Extension, Single terminal	Exalt	S002T04	2
10.7-11.7GHZ 3’ Dish Antenna	Radio Waves	HP3-11EX	2
Pole Mounting Kit	Poly Phaser	IX-POLE-KIT	2
Surge Protection	Poly Phaser	IXG-05	4
Radio 4.9-5.85 GHz	Redline	3KRR-G-G-T5X-GPS	4
Frequency Engineering & Coordination	Redline	FCC App & Eng	1
PMP Sector Controller Software	Redline	MSV-SC-512	4
AC Power input	Redline	80i-POE-1A	4
Flat Panel Dual-polarization Antenna	Redline	A9014MTD	4
4.9-5.9 GHz, 14 dBi, 90 degree			
AC POWER CORD	Redline	PPT-B	4
PTP to PMP upgrade for security	Redline	SecurelinkSC	4
Heavy Duty Mast Mounting Kit	Redline	3K-HD-MNT	4
GPS Antenna Installation Kit	Redline	3K-GPS-ANT	1
Sync Cable Kit	Redline	3K-SYNC-CBL	2
Omni-Directional Antenna	Kathryn Scala	OGB9-915N	2
900MHZ Spread Spectrum Radio (Wells)	GE-MDS	Transnet 900	1
Trio JR Ethernet Radio	Schneider Electric	TBURJ-R900-00-002-E-H-0	1

4.0 Modifications to Part III – PLANS FOR CONSTRUCTION

A. DELETE the following Plan Sheets and REPLACE with the Plan Sheets included with Addendum No. 3:

- Sheet C19 – Grading, Paving & Erosion Control (2 of 5)
 - Sheet C20 – Grading, Paving & Erosion Control (3 of 5)
 - Sheet C21 – Grading, Paving & Erosion Control (4 of 5)
 - Sheet C22 – Grading, Paving & Erosion Control (5 of 5)
 - Sheet C29 – Service Level 9 Pump Station Plan View
 - Sheet C30 – Service Level 9 Pump Station Plan View
 - Sheet C47 – Miscellaneous Details (6 of 6)
 - Sheet E11 – Proposed One-Line Diagram – Part 1
 - Sheet E38 – Security System Connection Diagram
- B. SHEET C23 – PIPING PLAN (1 OF 2) – ADD note 9 to read as the following:
- “Existing 60” BFV and existing harnessed mechanical coupling to be replaced on the 60” inlet of the existing 7.5 MG GST.”
- C. SHEET C24 – PIPING PLAN (2 OF 2) – REVISE note on existing 7.5 MG GST outlet piping to read as the following:
- “Existing 48” BFV and existing harnessed mechanical coupling to be replaced. See sheet C5A for valve locations.”
- D. SHEET C25 – WATER PIPING PROFILES (1 OF 2) – REVISE and REPLACE the 4” schedule 40 PVC note on WATER LINE A with the following:
- “4” Ductile Iron piping”
- E. SHEET A-6 – ON-SITE GENERATION BUILDING – REVISE and REPLACE the galvanized grating note on FLOOR PLAN Section 1 with the following:
- “Dotted line indicates FRP grate platform”
- F. SHEET E24 – ELECTRICAL SITE PLAN – Add the following note to the Notes list:
- “7. Ductbank #1 should be routed around the proposed sump pump vault.”
 - “8. The contractor shall hire an engineer registered in the State of Texas to provide signed and sealed calculations illustrating that all existing vault walls are structurally adequate once the required ductbank penetration is made in the existing concrete wall. If analysis demonstrates that the area around the penetration should be reinforced then the contractor’s engineer shall determine the means and extent of reinforcement required. For bidding purposes, the contractor shall assume the installation of 40’ of W8x31 beams along with any necessary gussets, bolts, welds, and incidentals shall be required.”
- G. SHEET E33B – CABLE/CONDUIT DUCTBANK SECTIONS –VIII – ADD the following:
- Ductbanks 589, 590 & 593: Add section ID 13B to each.

- H. SHEET E80 – ELECTRICAL MISCELLANEOUS DETAILS – 1 – ADD the following note to detail D – Pre-Cast Vault Detail:
- “Provide OSHA compliant ladder with safety climb system in all vaults. Reference Sheet C39 detail 2 for ladder details.”

5.0 Questions and Answers

Q1: Are Subcontractors required to attend the mandatory Pre-Proposal Site Visit meeting that is being held February 11, 2014 at 10:00 a.m. or is this requirement only for the General Contractors that plan on submitting a proposal for this project?

Response: As indicated in the Invitation for Competitive Sealed Proposals, if you are a General Contractor that intends to submit a proposal, then you were required to attend and sign in at the Mandatory Site Visit that was held on February 11, 2014. The sign-in sheet can be referenced in Addendum No. 2, issued on February 14, 2014.

Q2: If the 4-foot excavation recommended in Table 7 of the January 18, 2013 Geotechnical Report encounters fat clay, should the excavation continue until all the fat clay is removed? (For example, this might be the case near Boring B-5, which indicates fat clay to a depth of 5 feet)
And if the answer is Yes, and the resulting overexcavation is authorized by the Owner, what provisions of the project documents apply: Those of Section 02200-3.02.B.4.d(4), or Section 13205-2.01.F?

Response: The intent is to remove all clays as described in Note 2 of Table 7 of the Geotechnical Report, which may require excavations in excess of 4 feet. The contractor should assume excavations of at least 5 feet, for bidding purposes. The provisions of Section 13205, Part 2.01(F) shall apply. Technical Specification 02200 has been updated to provide further clarification. Reference Part 3.0 of this Addendum.

Q3: According to page 13 of the Geotechnical Report, the site classification is Site Class D. However, according to Section 13205-2.01.B.6 of the tank specs, the site classification is Site Class B. What is the correct seismic site classification?

Response: The seismic classification has been updated in Technical Specification 13205. Reference Part 3.0 of this Addendum.

Q4: Specification Section 02615 DIP and Fittings 2.02 C. requires that the t-head bolts for the MJ fittings to be coated with ceramic-filled, baked-on fluorocarbon resin; Xylan colored white a proprietary product of the Whitford Corp. SAWS specification does not require MJ T-head bolts to be coated with a ceramic-filled, baked-on fluorocarbon resin. The industry standard for coating T-Head bolts with ceramic-filled, baked-on fluorocarbon resin is Cor-Blue. Will a ceramic-filled, baked-on fluorocarbon resin coating be required on the MJ T-

Head bolts? If so, will the industry standard Cor-Blue be allowed in addition to the Xylan?

Response: The ceramic-filled, baked-on fluorocarbon resin will be required. The Cor-Blue-coated T-head bolts will be allowed in addition to the Xylan-coated T-head bolts. Technical Specification 02615 has been updated. Reference Part 3.0 of this Addendum.

Q5: I see the Naco Pump Station is back out for bid and there is a mandatory site visit next Tuesday. Are we allowed to bid on this project if we did not attend the original pre-bid in December?

Response: The requirements of the original Request for Competitive Sealed Proposals (Solicitation No. B-13-021-DD) do not apply to this current Request for Competitive Sealed Proposals (Solicitation No. B-14-005-DD).

Q6: Specification Section 02617 2.02 A.1.b.i. 1. "SL9 Pump Station Piping... = 200wpsi"
Specification Section 02617 2.02 A.1.b.i. 2. "All Other Piping... = 150wpsi"
Specification Section 02617 2.02 A.1.b.ii. "Surge Allowance = 100psi minimum. Total Pressure = Working Pressure + Surge Allowance"
Specification Section 02617 2.02 B.3. "For Fittings with Flanges: ...Pipe flanges shall be of rated pressure equal to or greater than the adjacent pipe class. Flanges shall match the fittings or appurtenances which are to be attached. Flanges shall be Class F in accordance with AWWA C207 and drilled in accordance with ANSI B16.1 Class 125
Specification Section 02617 2.01 C. indicate the bolts class and seem to indicate that there may be a variety of Steel Flange Classes "B", "D", "E" or "F" flanges
Steel Flange Classes – Class "D" 150# Bolt Pattern/175-150psi; Class "E" 150# Bolt Pattern/275psi; Class "F" 250# Bolt Pattern/300psi
- These class psi ratings indicate max pressure (no surge allowance)
All of the AWWA Valves specified on the project are 150# Bolt Pattern; however they vary in working and test pressures but all are under 250psi
It seems a universal Class "E" Steel Flange system would cover all pressure requirements while allowing for mating to the currently spec'd valves...will you clarify the class type of steel flanges you would like for the individual systems or for the whole project (from Class "D", "E" or "F" flanges)?

Response: The design pressure and flange requirements have been modified in Technical Specifications 02617 and 15088. Reference Part 3.0 of this Addendum.

Q7: Pumps and Controls, Inc. would like to be named as an approved systems integrator for the chemical feed pumps and accessories specified in the above project.

Pumps and Controls, Inc., since 1986, is a master distributor for LMI chemical dosing pumps for Texas, Louisiana, Oklahoma, Arkansas, New Mexico, and Mississippi.

At Pumps and Controls, Inc., we custom build chemical feed systems and can act as a systems integrator for projects with chemical feed equipment needs. This includes, and not limited to, equipment selection, development of specifications, provide startup, training, installation, and service.

I have attached a catalog which will provide you with a detailed overview of our products and services.

Thank you for considering Pumps and Controls, Inc. as a strategic partner to supply chemical feed equipment for this project.

Response: Technical Specification 11242 lists chemical equipment approved for this project. Pumps and Controls, Inc. is welcome to bid the chemical system, provided that their equipment meets the specifications. See Division 16 for the approved list of process control integrators

Q8: I wanted to touch base with you and provide you with some information on Periflo equipment after reviewing the above project. I am including a reference page of customers along with hundreds of installations. We have been in business since 1988 installing, troubleshooting, repairing, and servicing chlorination equipment. We service the majority of the WP's, WWTP's, WCID's, and MUD's in the Houston and surrounding areas to the south, east, west and north. Although we service and have installed all major brands of chemical feed equipment, we are able to offer the customer a discount off of Pulsafeeder equipment. If you need any more information from me please let me know. James Manuel would be happy to help in any way with technical information/questions if you need any assistance in planning any job in the future. We can assist with drawings if needed as well. We look forward to working with you on this and future projects. I would appreciate your consideration of Periflo equipment as an approved equal on the above mentioned project instead of just Watson Marlow peristaltic pumps in order to provide the customer a competitive bid. Thank you again for your time in advance.

The following are some links for Periflo peristaltic pumps:

<http://www.pulsa.com/products/pumps/periflo-series/periflo-fmp/periflo-fmp-30>

<http://pulsa.salesmrc.com/Details.aspx?ID=2774>

<http://www.pulsa.com/products/pumps/periflo-series/periflo-rbt/periflo-rbt-70>

<http://pulsa.salesmrc.com/Details.aspx?ID=2775>

Response: The list of pump manufacturers has been updated in Technical Specification 11242. Reference Part 3.0 of this Addendum.

Q9: Item 1.06.D.3 and 2.03.B [Clarification]: The specs require the pumps to receive a 1 pt NPSHr test with a margin of 25%. The pumps will meet this requirement. Note that the 8LR-18S will have NPSHr of 37ft at run-out. NPSHa at run-out is

not specified. NPSHa at design is 39.3ft. If this is the NPSHa at run-out, max flow will be 5,500gpm to maintain 25% margin. Please confirm this is acceptable.

Response: The maximum allowable NPSH required at runout has been added to Technical Specification 11211. Reference Part 3.0 of this Addendum.

Q10: Item 1.06. I [Clarification]: This section requires testing with the job motor. The Chesapeake factory test stand cannot accommodate 4160V motors. Will the Engineer allow testing with factory calibrated motor? Flowserve will not meet the specification without this change.

Response: The requirements of Technical Specification 11211, Part 1.06 will not be modified at this time.

Q11: Item 2.03.B [Clarification]: The specs I have are showing the condition is still 335ft @2000gpm. The TDH at the secondary capacity will be 325ft. Please confirm this is acceptable. Flowserve will not meet the specification without this change.

Response: The secondary head of 325 feet instead of 335 feet will be acceptable, provided that all other requirements for Pumps 4-9 and 5-9 identified in Technical Specification 11211 are met.

Q12: Regarding the Painting on Butterfly section 15092 and Ball Valves section 15090

Both specifications, in paragraph 1.02 "Quality Assurance", reference San Antonio Water System (SAWS) latest specifications and American Water Works Association (AWWA), AWWA C504. Both allow either a 2 part epoxy coating or fusion bond epoxy coatings. Paragraph 2.01 paragraph H states "...valves shall be coated with a fusion bonded epoxy coating, 25 mils minimum dry film thickness." Is a two part epoxy coating per the reference SAWS and AWWA specification allowable, and if so, what thickness.

Please see below:

Naco Project Specifications:

Section 15092

Part 1 - General

1.02 – Quality Assurance:

A – References:

1 - San Antonio Water System (SAWS) latest specifications.

This Reads as Follows:

SAWS Material Specifications:

Valve Butterfly 150-250 Dec 12

5. PAINTING

- a. All interior and exterior ferrous surfaces of the valve, including the disc, shall be coated with epoxy, N.S.F. 61 certified or fusion bonded epoxy, N.S.F.61 certified. The epoxy (or fusion bonded epoxy) shall have a nominal thickness of 8 mils, and shall be in accordance with AWWA C550, latest revision.

Naco Project Specifications:
Section 15092
Part 1 - General
1.02 – Quality Assurance:
A – References:
2. American Water Works Association (AWWA)

This Reads as Follows:
ANSI/AWWA –C504-10
Rubber-Seated Butterfly Valves, 3In. Through 72 In.
Sec. 4.4 Coatings

4.4.1 *Interior and exterior surfaces.* Interior surfaces of valves and exterior surfaces of buried valves, except stainless steel, machined, or bearing surfaces, shall be shop-coated with an epoxy coating conforming to the requirements of ANSI/AWWA C550 to a minimum dry film thickness of 8 mil and when required in the purchase documents shall be NSF/ANSI 61 Approved.

Response: The allowable coating systems for the butterfly and ball valves have been updated in Technical Specifications 15090 and 15092. Reference Part 3.0 of this Addendum.

Q13: Please review the attached pump curve from Patterson Pump. Patterson is listed and can meet all requirements with the exception of the 1200 rpm restriction. Is the attached 1800 rpm pump acceptable?

Response: The pump speed requirements in Technical Specification 11211 have been modified. Reference Part 3.0 of this Addendum.

Q14: 1. SIR-2, C.f states three (3) potable water pump station with a minimum total design output of thirty (30) MGD. Does each pump station need to be thirty (30) MGD or is that a total of 30 MGD for all three (3)?
2. SIR-2, C.f states potable water pump stations only. Is there a reason wastewater pump stations cannot be included? I ask that wastewater pump stations be included in the criteria.

Response: The potable water pump station experience requirements in the Supplementary Instructions to Respondents have been modified. Reference Part 2.0 of this Addendum. Wastewater pump stations cannot be included to satisfy the requirements of this section.

Q15: Why is construction of the proposed 5.0 GST dependent on completion of the OSG Containment Building? I do not see how that would impact construction of the new GST.

Response: Naco Pump Station shall remain operational at all times throughout the construction phase. Therefore, chlorine and fluoride facilities must be accessible for daily deliveries. Access to the chlorine and fluoride facilities will occur from the South side of the buildings during construction of the OSG Containment. The conflicts and phasing are described on Sheet C4 under the "Warnings -E" section.

Q16: Will there be room on-site for a construction trailer and laydown area?

Response: The contractor shall become familiar with the site in order to determine location of on-site trailer and laydown area prior to submitting his proposal to the Owner. Site shall remain accessible to SAWS maintenance personnel throughout construction. In addition, Lot 45 located immediately adjacent to SAWS Northeast Service Center can be used for the Contractor's laydown area. Reference Part 2.0 of this Addendum.

Q17: I do not see where there are any Existing grade line elevations called out on sheets C18-C22. Only Proposed grade elevations. Please advise.

Response: Existing grade line elevations have been added to Sheets C18-C22. Reference Part 4.0 of this Addendum.

Q18: Looking at the Naco Pump Station Improvements Project, how would I go by getting Team One Integration, LLC onto the Application System Provider (ASP) list in division 17300, Part 1.05 C of the specification?

Response: Interested firms must meet the requirements stipulated in Technical Specification 17300. Please note that the firms listed in 1.05(C) of this section are recommended.

Q19: Sheet C48 is a detail for TXDOT Guardrail. I do not see where this gets installed on this project. Is this getting installed on this project?

Response: The TXDOT Guardrail is being installed along the southwestern side of the proposed 5 MG GST. The guardrail is called out on Sheet C17 as points 78-80.

Q20: 03300, 3.18 calls for The Electrical Building Girder to be 4000psi. Drawing S1-B and S1-d call for 5000psi. Please clarify.

Response: The concrete strength has been modified in Technical Specification 03300. Reference Part 3.0 of this Addendum.

Q21: 1. On page SIR-2, item i, as it relates to the experience of the Construction Team with the (PCSI) and the (ASP) providers, it is unclear as to exactly what is required to satisfy this portion. Especially when you start reading the five

bullets listed below the first paragraph and when you also consider that the instrumentation specifications have already pre-selected both (PCSI) and (ASP) for the project. Can you please provide some additional direction so we can properly satisfy this portion of the proposal?

2. In some locations of the specifications, the contractor is required to pay for testing such as concrete and soils, however some location indicate otherwise. Can you please confirm who pays for testing.

Response: 1. The firms listed in 1.05(C) and 1.06(D) of Technical Specification 17300 are recommended.

2. The Contractor is responsible for all required testing on this project.

Q22: 1. On sheet E24, duct bank #1 has 103 conduits. This duct bank starts from the new electrical building and runs to the existing vault that feeds the existing site. Since this duct bank is so large and the drawings indicate that this duct bank is going through the sump pump pit area. Is it possible to relocate the sump pump pit along with the sump pump control rack to the other side of the electrical building, meaning to the northwest side of the building next to the road?

2. On sheet E24 duct bank #1, at the existing vault, we need to cut out a very large hole to terminate the new duct bank of 103 conduits. If we cut a hole that is 5 feet by 6 feet, will the existing structure still be sound and or sufficient enough to cut a hole that big?

3. How far apart does the 5 KV duct bank need to be from the 600 volt duct bank?

4. On sheet E11, WP 7 indicates there is 3 – 4/0 5 KV cable to a 900 HP motor with FLA of 119 and on sheet E12, WP 6 indicates there is 3 - #1 5 KV cable to a 900 HP motor with FLA of 119. Please advised.

5. On sheet E80, item C typical duct bank transition detail, do you want the elbow taped with scotch 50 or do you want a PVC coated elbow?

6. On sheet E80, item D pre-cast vault detail, some of the vaults will be approximately 20 feet deep. That is the bottom of the manhole will be 20 feet deep. With that said, these manholes will be approximately 7' x 7' x 7' high. These manholes will probably have about 13 feet of dirt on top of them. I am assuming that we will use 3' diameter necks from the top of the manhole and rise up to the level of the ground. We will use a 3' ring and cover on top of the necks. I am assuming you want a ladder attached to the manhole neck to get down to the manhole itself. Please advise if this is expectable.

7. On sheet E24 between the existing tank and SL-6 and SL-9 Pump Stations, what is the depth of the duct bank at that location? There is no cut on the C drawings to see what the height of the duct bank should be.

8. On sheet E24A, what is the scale for the drawing?

9. On sheet E33B – Section ID#'s 589 – 593. It looks like we are intercepting existing 2" conduits that go to the NESC building communication panel. I cannot find the "proposed NESC fiber optic handhole" or the location of the existing 2" conduits from the NESC building on the prints.

Response: 1. The sump pump pit cannot be relocated, but the ductbank can be re-routed around the proposed sump pit area. Reference Part 4.0 of this Addendum.

2. A note has been added to Sheet E24 in reference to the hole that will be cut in the existing vault wall. Reference Part 4.0 of this Addendum.

3. The ductbanks can be installed together. The 5kV conduit needs to be separated from the 600V conduit by 7.5" minimum.

4. Sheet E11 has been revised. Reference Part 4.0 of this Addendum.

5. The elbow should be taped. All rigid steel conduit should be taped when it is in contact with concrete or soil. Wrap conduit 6" above contact area of soil or concrete.

6. Sheet E80 has been updated to include an OSHA compliant ladder. Reference Part 4.0 of this Addendum.

7. The flow line elevation of the two 48" outlets on the existing 7.5 MG ground storage tank is 820.00'. The ground elevation is 829.00'. The ductbank needs to be installed so that it crosses under the piping.

8. This part of the site was not included in the survey; therefore, no scale is provided on the drawing.

9. Refer to sheet E7 detail C. The handhole is to be installed in the area that is currently occupied by the junction box which is adjacent to the gate access panel. The existing 2" conduits come to this location. Conduits 589, 590 & 593 should also be included in ductbank 13B. Reference Part 4.0 of this Addendum.

Q23: 1. Drawing C32 is the existing pipe, fittings and valves to be painted?
2. Drawing A6 and A9 is the grating to be FRP or Galvanized?
3. Drawing S-4A note on handrail refers us to the Architectural drawings. The architectural drawings for this area do not define the handrail type. Please provide handrail type for this area?
4. Drawing C24 what is the elevation of the existing underground suction pipe at the existing 7.5mg storage tank?
5. Drawing C24 will harness mechanical couplings be required on the 48" outlet valve replacements at the existing 7.5mg storage tank?

Response: 1. Existing piping, fittings and valves shall only be painted if damaged during construction.

2. Note on Sheet A-6 has been revised to indicate FRP grating. Grating shall be FRP on both Sheets A-6 and A-9. Reference Part 4.0 of this Addendum.

3. Railing shall be aluminum per Detail 2, Sheet A-6.

4. The flow line elevation of the 48" suction pipes at the existing 7.5 MG ground storage tank are 820 feet.

5. Existing harnessed mechanical couplings are currently on the 48" outlet and 60" inlet pipes and will need to be replaced. Reference Part 4.0 of this Addendum.

Q24: 1. Specification Section 13205, pg 5, Article 2.01.F, requires that the contractor will provide a geotechnical report performed by an independent third party. The geotechnical firm providing this report cannot be the same firm that has provided the geotechnical report contained within these Contract Documents. Please confirm that if the geotechnical report obtained by the contractor reveals any conditions that vary from the information available at the time of bid that these items would be handled as a change order or included as a unit pay item in the bid form.

2. Contract Drawing Sheet C39, GST Exterior Ladder Detail indicates that the ladder material shall be Stainless Steel. The ladder gate material is called out as aluminum, please confirm the material of the ladder gate.

Response: 1. Per Section 13205, 2.01, F, there shall not be any additional payment or contract time extension to Contractor for additional geotechnical investigations and resulting additional work that may be required to complete the project.

2. The ladder gate is correctly identified as aluminum.

Q25: Per the proposal checklist, we are to include forms TWDB-0255, TWDB Form 0459, and TWDB Form SRF-404. I have been unable to locate these forms, would you be able to make these forms available? Also, is TWDB-0373 to be included with the bid submittal?

Response: Both the TWDB-0255 and TWDB Form 0459 were included and can be found immediately preceding the TWDB-0210 (Guidance for U.S. Environmental Protection Agency Disadvantaged Business Enterprise Program) within the specifications. The TWDB Form SRF-404, was inadvertently omitted and has been included with this Addendum. Reference Part 2.0 of this Addendum.

Yes, the TWDB-373 is a required form and must be included within the proposal packet. Respondents should utilize the Proposal Checklist when preparing their response to this IFCSF to ensure that all required documents and requested information are included with their submission.

Addendum No. 3
Naco Pump Station Improvements Project
SAWS Project No. 12-6003
Solicitation No. B-14-005-DD

Q26: Regarding the bid bond, are we to use a Standard AIA bid bond form? On the attached proposal certification, there is not a place for the bonding company to sign. Please advise.

Response: SAWS does not dictate a specific bid bond form for Respondents to use when submitting a proposal. Respondents should coordinate with their respective surety company. The Proposal Certification page is a required form, as indicated on the Proposal Checklist, but the form does not require the signature of a surety company.

Addendum No. 3
Naco Pump Station Improvements Project
SAWS Project No. 12-6003
Solicitation No. B-14-005-DD

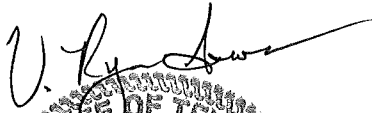
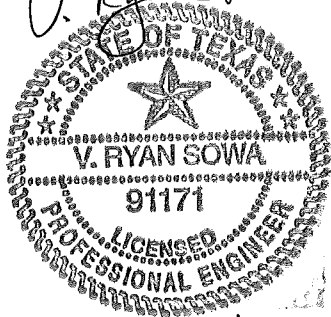
ACKNOWLEDGEMENT BY BIDDER

Each bidder is requested to acknowledge receipt of this Addendum No. 3 by his/her signature affixed hereto and to file same and attach with his/her proposal.

The undersigned acknowledges receipt of this Addendum No. 3 and the proposal submitted herewith is in accordance with the information and stipulations set forth.

Date

Signature



02/20/14

Kimley-Horn and Associates, Inc.
Texas Registered Engineering Firm F-928
601 NW Loop 410, Ste. 350
San Antonio, TX 78216

PRICE PROPOSAL

PROPOSAL OF _____, a corporation

a partnership consisting of _____

an individual doing business as _____

THE SAN ANTONIO WATER SYSTEM

Pursuant to Instructions and Invitations for Competitive Sealed Proposals, the undersigned proposes to furnish all labor, materials, equipment and supervision as specified and perform the work required for the various improvements (including a new SL-9 pump station, 5.0MG concrete ground storage tank, electrical and chemical buildings, onsite sodium hypochlorite generation system, and SCADA programming) off of O'Connor Road; San Antonio Water System Job No. 12-6003 in accordance with the Plans and Specifications for the following prices to wit:

BASE UNIT PRICES:

ITEM NO.	ITEM DESCRIPTION (Price to be written in words)	UNIT	QTY.	UNIT PRICE (Figures)	TOTAL (Figures)
1.	Naco Pump Station Improvements – Furnish all labor, materials, equipment, and superintendence required for the various improvements identified in these Contract Documents (defined further in Technical Specification 01270), complete in place. _____ Dollars and _____ Cents Per Lump Sum	LS	1	\$ <u>XXXX.XX</u>	\$ _____
2.	Mobilization and Demobilization – Furnish all labor, materials, equipment, and superintendence required to mobilize, demobilize, bond and insure the Work, in accordance with the Contract Documents (defined further in Technical Specification 01270), complete in place. _____ Dollars and _____ Cents Per Lump Sum	LS	1	\$ <u>XXXX.XX</u>	\$ _____
3.	SCADA Programming – Furnish all labor, materials, equipment, and superintendence required to integrate the high service pump station programming as identified in these Contract Documents (defined further in Technical Specification 01270), complete in place. _____ Dollars and _____ Cents Per Lump Sum	LS	1	\$ <u>XXXX.XX</u>	\$ _____

4.	Permitting Allowance – Allowance for permitting fees associated with the Project. This shall include furnishing all labor, materials, equipment, and superintendence required to obtain all necessary permits. Contractor to pay and be reimbursed actual amount by SAWS. <u>Ten Thousand</u> Dollars and <u>No</u> Cents Allowance	Allowance	<u>\$ 10,000.00</u>	<u>\$ 10,000.00</u>
5.	CPS Energy Allowance – Allowance for any fees from CPS Energy associated with electrical improvements for the Project. Contractor to pay and be reimbursed actual amount by SAWS. <u>Ten Thousand</u> Dollars and <u>No</u> Cents Allowance	Allowance	<u>\$ 30,000.00</u>	<u>\$ 30,000.00</u>
6.	Start-up / Commissioning Allowance – Allowance for unforeseen construction – related items (not included in the Project scope) associated with the pre-start up, start-up, and commissioning services. Work under this pay item will be negotiated on an individual basis for each task requested by the Owner. <u>One Hundred Thousand</u> Dollars and <u>No</u> Cents Allowance	Allowance	<u>\$ 100,000.00</u>	<u>\$ 100,000.00</u>
TOTAL PRICE AMOUNT _____ Dollars and _____ Cents		\$ _____		

RESPONDENT'S SIGNATURE & TITLE

FIRM'S NAME (TYPE OR PRINT)

FIRM'S ADDRESS

FIRM'S PHONE NO./FAX NO.

FIRM'S E-MAIL ADDRESS

The Contractor herein acknowledges receipt of the following Addendum Nos. _____

OWNER RESERVES THE RIGHT TO ACCEPT THE OVERALL MOST RESPONSIBLE PRICE PROPOSAL.

1. Offeror acknowledges that estimated quantities are not guaranteed, and are solely for the purpose of comparison of Price.

Note: Complete the additional requirements of the proposal which are included on the following pages.

2. Any and all Addenda which are issued by the San Antonio Water System with appropriate signatures which acknowledge receipt shall be attached to and made a part of this Price Proposal.

3. The Offeror offers to construct the Project in accordance with the Contract Documents for the contract price and to complete the project within **730 calendar days** after the start date, as set forth in the Authorization to Proceed. The Offeror understands and accepts the provisions of the Contract Documents relating to liquidated damages of the Project if not completed on time.

4. The Undersigned agrees to commence work on a date to be specified in a written "Authorization to Proceed", and to substantially complete the work in **700 calendar days** and complete all the work in **730 calendar days** from that date.

TWDB Project Number

CERTIFICATION REGARDING DEBARMENT, SUSPENSION, AND OTHER RESPONSIBILITY MATTERS

The prospective participant certifies to the best of its knowledge and belief that it and its principals:

- (a) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency;
- (b) Have not within a three year period preceding this proposal been convicted of or had a civil judgement rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State, or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;
- (c) Are not presently indicted for or otherwise criminally or civilly charged by a government entity (Federal, State, or local) with commission of any of the offenses enumerated in paragraph (1)(b) of this certification; and
- (d) Have not within a three-year period preceding this application/proposal had one or more public transactions (Federal, State, or local) terminated for cause or default.

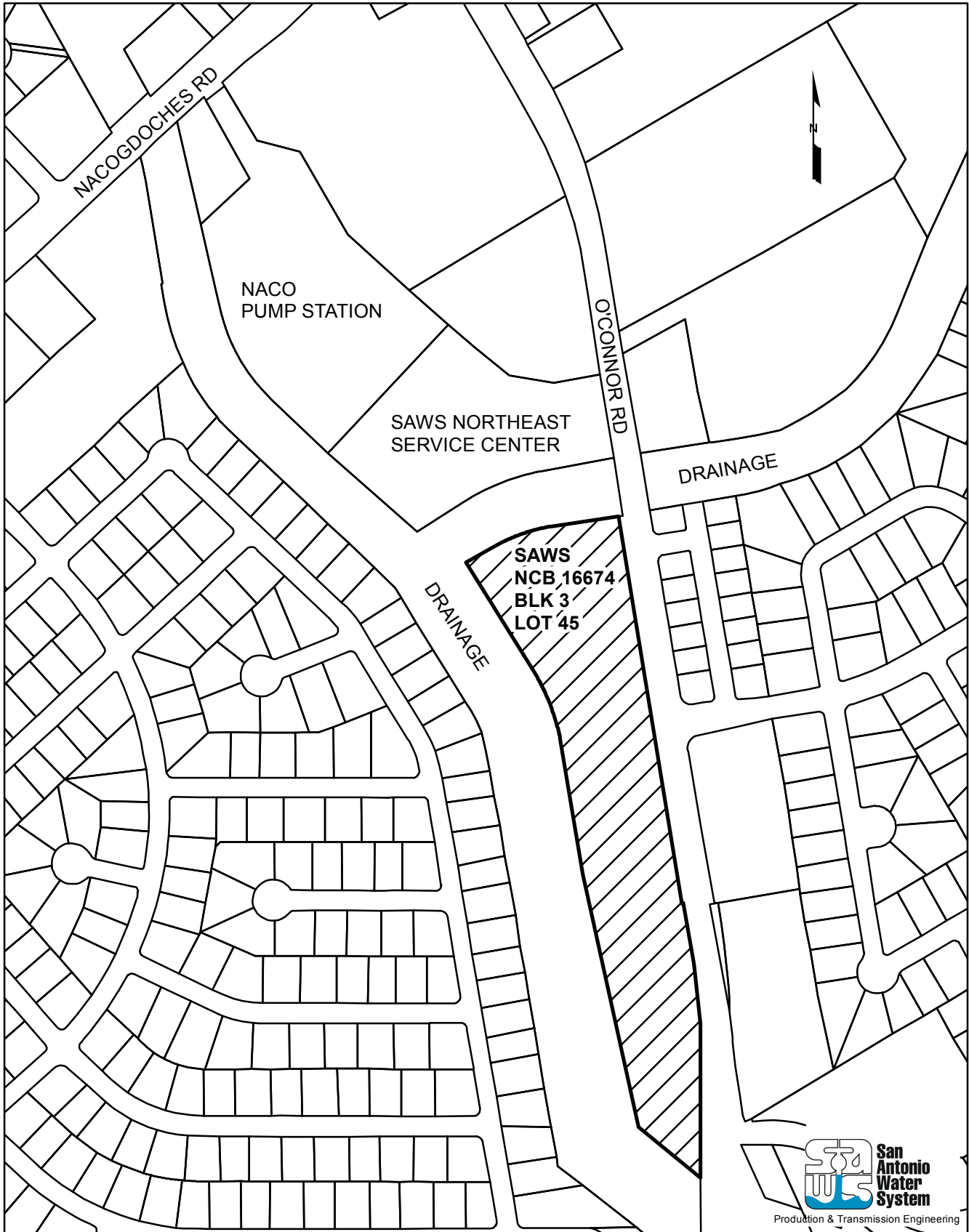
I understand that a false statement on this certification may be grounds for rejection of this proposal or termination of the award. In addition, under 18 USC Sec. 1001, a false statement may result in a fine of up to \$10,000 or imprisonment for up to 5 years, or both.

Typed Name & Title of Authorized Representative

Signature of Authorized Representative

Date

SAN ANTONIO WATER SYSTEM PROJECT SITE MAP



**NACO PUMP STATION IMPROVEMENTS PROJECT
(JOB NO.12-6003)**



San Antonio Water System

PROJECT CONSTRUCTION PROGRAM

DAILY CONSTRUCTION REPORT

PROJECT: _____

CONTRACTOR: _____ JOB NO. _____

DAY: _____ DATE: _____ WORK PERIOD: _____ A.M. P.M. TO: _____ A.M. P.M. REPORT NO: _____

WEATHER: _____ TEMP. MAX _____ °F / MIN _____ °F PRECIPITATION: _____

PERSONNEL EMPLOYED		MAJOR EQUIPMENT ON PROJECT		
CONTRACTORS	SUBCONTRACTORS	NO.	DESCRIPTION	HRS. OP
_____ Administrative	_____ Mechanical	_____	Cranes	_____
_____ Supervisors	_____ Electrical	_____	Loaders	_____
_____ Carpenters	_____ Instrumentation	_____	Backhoes (Trk)	_____
_____ Iron Workers	_____ Sitework	_____	Backhoes (Tire)	_____
_____ Finishers	_____ Masonry	_____	Dozers	_____
_____ Operators	_____ Roofing	_____	Welders	_____
_____ Pipelayers	_____ Rebar	_____	Pumps	_____
_____ Laborers	_____ Foundation	_____	Compressors	_____
_____ Truck Drivers	_____ Painting	_____	Dump Trucks	_____
_____	_____	_____	Hitqchi Excavator	_____
_____	_____	_____		_____

WORK PERORMED TODAY: _____

COMMENTS: _____

Not on site. by telephone

PROJECT REPRESENTATIVE'S SIGNATURE

DATE

SECTION 02360

VEGETATION RESTORATION

PART 1 GENERAL

1.01 SCOPE

This section shall govern the work of restoring grass, trees, and shrubs damaged or removed by construction operations associated with the installation of the water transmission system, as identified in the contract documents for this project.

1.02 QUALITY ASSURANCE

- A. Seeds shall meet the requirements of the Texas Seed Law (Texas Administrative Code, Title 4; Chapter 9) and shall be as near identical to native samples present on or near the disturbed area of soil.
- B. All planting of grasses, shrubs and trees shall be completed as soon as practical to avoid erosion of topsoil and damage incurred as a result of siltation and flooding unless otherwise directed by the ENGINEER.
- C. Trees and shrubs moved from the area disturbed by the construction of the water transmission line shall be transplanted to an adjacent area where possible and practical in lieu of planting of new specimen in that area.

1.03 SUBMITTALS

- A. Submit the following materials certification:
 - 1. Topsoil source and pH value.
 - 2. Shredded Pine Bark.
 - 3. Plant Fertilizer.
 - 4. Grass source and species.
 - 5. Tree source and species.
- B. Provide preconstruction inventory:

1. Resources to be salvaged and transplanted, including topsoil, rare plant species and trees.
2. Include selected areas designated for storage and stockpiling.
3. Indicate locations and samples of future watering and planting areas.
4. Identification and mapping of erosion control structures required.

1.04 DELIVERY, STORAGE AND HANDLING

- A. Deliver fertilizer materials in original, unopened and undamaged containers showing weight, analysis and name of manufacturer. Store in a manner to prevent wetting and deterioration and to assure maximum effectiveness.
- B. Take all precautions customary in good trade practice in preparing plants for transplanting and moving. Workmanship failing to meet the highest standards will be rejected. Dig, pack, transport and handle plants with care to ensure protection against injury. Inspection certificates required by law shall accompany each shipment invoice or order to stock and, on arrival, the certificate shall be filed with the OWNER. Protect all plants from drying out. If plants cannot be planted immediately upon delivery, properly protect them with soil, wet peat moss, or in an acceptable manner to the OWNER. Water heeled-in plantings daily. No plant shall be bound with rope or wire in a manner that could damage or break the branches.
- C. Provide dry, loose topsoil from the original disturbed construction when possible or furnish topsoil of equal value for planting bed mixes. Frozen or muddy topsoil is not acceptable.
- D. Deliver seed materials in original, unopened and undamaged containers showing weight, analysis and name of manufacturer. Store in manner to prevent wetting and deterioration and to assure maximum effectiveness.

1.05 PROJECT CONDITIONS

- A. Work notification. Notify ENGINEER and OWNER at least seven (7) work days prior to installation of seed and trees.
- B. Protect existing utilities, paving and other facilities from damage caused by landscaping operations and incurred during transplanting and restoration.
- C. Perform seeding work only after planting and other work affecting ground surface has been completed.

- D. Restrict traffic from newly planted areas. Erect signs and barriers as required.

1.06 WARRANTY

- A. Warrant trees to remain alive and to be in healthy, vigorous condition for a minimum period of one (1) year after completion and Final Acceptance of entire Project. Observation of trees will be made by the OWNER at completion of planting.
- B. Replace, in accordance with the plans and specifications, all trees that are dead or, as determined by the OWNER, are in an unhealthy or unsightly condition, or have lost their natural shape due to dead branches, or other causes due to the Contractor's negligence. The cost of such replacement(s) is at the Contractor's expense. Warrant all replacement plants for one (1) year after installation.
- C. Warranty shall not include damage or loss of trees, or grass caused by fires, floods, freezing rains, lightening storms, or winds over 75 mph, winter kill caused by extreme cold and severe winter conditions not typical of planting area; acts of vandalism or negligence on the part of the OWNER.
- D. Remove and immediately replace all grass and trees, as determined by the OWNER to be unsatisfactory during the initial planting installation.
- E. The guarantee period shall begin upon completion of the provisional acceptance. All grass materials shall be guaranteed by the Contractor for a period of sixty days (60) from the date of provisional acceptance, to be in good, healthy, and nourished condition. The exceptions are damages resulting from neglect by the property OWNER, abuse or damage by others, or unusual phenomena or incidents which are beyond the Contractor's control.
- F. During the grass establishment period, it shall be the Contractor's responsibility to ensure that the grass is continuing healthy growth. This care shall include labor, water and material necessary to keep the project in a presentable condition. Repair and reseed any and all damaged areas.
- G. Water application shall be accomplished each week from March through October, and as necessary during other periods of the year. An even application of one-inch minimum of water shall be required over all seeded areas weekly or less, depending on rainfall frequency. The rate and frequency of water application may be changed, as directed by the OWNER, depending on weather, and soil conditions.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Provide tree species to replace those in kind removed by construction or as indicated on the construction plans.

- B. Topsoil to be furnished shall be in quantities and in locations as required for restoration, preferably from the area disturbed by construction of the water transmission line. If the quantity of excavated topsoil is inadequate for planting purposes, sufficient additional topsoil shall be furnished. Topsoil furnished shall be natural, fertile, friable soil, possessing characteristics of representative productive soils in the vicinity. It shall be obtained from naturally well drained areas. Topsoil shall be without admixture of sub-soil and free from bermuda grass, nut grass (*Cyperus Rotundus*), and other objectionable grass, weeds and toxic substances. Topsoil shall be checked by the Construction Observer/Inspector.

- C. Commercial fertilizer shall be Carefree, Vertagreen, or approved equal, organic fertilizer containing the following minimum percentages of available plant food by weight: 15-15-15 Nitrogen-Phosphorus for seeded areas. Mixed Nitrogen, not less than 50% from organic source. Inorganic chemical nitrogen shall not be derived from the sodium form of nitrate or from the ammonia nitrate. It shall be delivered to the site in unopened containers, each bearing the manufacturer's guaranteed analysis. Any fertilizer which becomes caked or otherwise damaged making it unsuitable for use will be rejected.

- D. Tactifier and binder: Natural vegetable gum containing gelling and hardening agents that when mixed with water and properly cured, shall form an insoluble network.

- E. Herbicide: Herbicide used shall be an easy to apply, effective in a short term, chemical agent to inhibit or destroy weed growth, while being harmless to seed and grass being implanted.

- F. Sand shall be sharp, clean sand and as similar to indigenous sand as possible.

- G. Water shall be furnished by the Contractor and shall be free of substances harmful to plant growth and shall be of equal or greater quality to existing water in the areas disturbed by construction of the water transmission line. Hoses or other methods of transportation shall be furnished by Contractor.

- H. Stakes for Staking. Hardwood, 2" x 2" x 8'-0" long.

- I. Stakes for Guying. Hardwood, 2" x 2" x 36" long.

- J. Guying/Staking Wire. No 10 or 12 gauge galvanized wire. Turnbuckles shall be of galvanized steel of size and gauge required to provide tensile strength equal to that of the wire. Turnbuckle opening shall be at least 3".
- K. Staking and Guying Hose. Two-ply, reinforced garden hose not less than ½ inches inside diameter.
- L. Tree Wrap. Standard waterproofed tree wrapping paper, 2 ½ inches wide, made of 2 layers of crepe kraft paper weighing not less than 30 lbs per ream, cemented together with asphalt.
- M. Twine. Two-ply jute material.
- N. **Seed**
 - 1. **All seed must meet the requirements of the Texas Seed Law including the labeling requirements. These labels shall show purity, germination, name and type of seed. Seed furnished shall be of the previous season's crop for the date of the project, and the date of analysis shown on each bag shall be within nine (9) months of the time of use on the project. Bermuda grass shall be hulled and treated and have a purity of 95% and germination of no less than 90%. Each variety of seed shall be furnished and delivered in separate bags or containers. A sample of each variety of seed shall be furnished for analysis and testing when directed by the Owner.**
 - 2. **Annual Rye grass will be free of Johnson grass, field bind weed, dodder seed, and free of other seed to the limits allowable under the Federal Seed Act and applicable Texas Seed Law. Annual Rye grass will be added into slurry between October 1 through March 15. No additional cost will be charged to the Owner.**
- O. **Mulch**
 - 1. **Wood Cellulose Fiber Mulch. Wood cellulose fiber mulch shall be natural cellulose fiber mulch produced from grinding clean, whole wood chips, or fiber produced from ground newsprint with a labeled ash content not to exceed 7%. The mulch shall be designed for use in conventional mechanical planting, hydraulic planting of seed or hydraulic mulching of grass seed, either alone or with fertilizer and other additives. The mulch shall be such that when applied, the material shall form a strong, moisture-retaining mat without the need of an asphalt binder. The mulch material will also be dyed with a green color to assist in determining coverage and to provide an immediate pleasing appearance. The wood cellulose fiber is**

also required to be dispersed rapidly in water to form a homogeneous slurry and remain in such state when agitated in the hydraulic mulching unit with the specified materials.

2. Straw Mulch or Hay Mulch. Straw mulch shall be oat, wheat or rice straw. Hay mulch shall be prairie grass, bermuda grass or other hay as approved by the ENGINEER. The straw mulch or hay mulch shall be free of Johnson grass or other noxious weeds and foreign materials. It shall be kept in a dry condition and shall not be molded or rotted.
- P. Sod. The sod shall consist of live, growing grass secured from sources where the soil is fertile. All grass sod shall have a healthy, virile root system of dense, thickly matted roots throughout the soil of the sod for a minimum thickness of 1 inch. The Contractor shall not use sod from areas where the grass is thinned out, nor where the grass roots have been dried out by exposure to air and sun to such an extent as to damage its ability to grow when transplanted. The sod shall be free from obnoxious weeds or other grasses and shall not contain any matter deleterious to its growth or which might affect its subsistence or hardiness when transplanted. Sources from which sod is to be obtained shall be subject to approval by the Engineer.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Security of stored materials will be the sole responsibility of the Contractor at no additional expense to the OWNER.
- B. It is the Contractor's responsibility to verify the location of all utility lines, electric cables, sprinkling systems and conduits so that the proper precautions must be taken not to disturb or damage any subsurface improvements. Should obstructions be found, the Contractor will promptly notify the OWNER. Any damage caused by the Contractor shall be repaired by himself at no cost to the OWNER. Any such repairs shall be subject to approval the by OWNER.
- C. Examine proposed planting areas and conditions of installation including finished surfaces, grades, topsoil quality and depth. Do not start planting, seeding work until unsatisfactory conditions are corrected.
- D. Planting shall be performed only by experienced workmen familiar with planting procedures under the supervision of a qualified supervisor.

- E. Locate trees as indicated or as directed in the field after staking by the Contractor. If obstructions are encountered that are not shown on the plans, do not proceed with planting operations until alternate plant locations have been selected. The ENGINEER shall be notified of the alternate plant locations selected prior to planting.

- F. Soil Preparation. Soil used in planting trees shall be topsoil as specified in Section 02910 SOIL PREPARATION, or suitable existing soil either of which shall be thoroughly mixed with the following: 6 cubic ft. shredded pine bark, ¼ cubic yard sand, 3 lbs sulfur, 6 lbs fertilizer, as specified, or "Rose Mix" as furnished by Garden Ville Horticultural Products, San Antonio, Texas. "Rose Mix" consisting of 10 parts compost, 6 parts Poteet sand, 6 parts small pine mulch, and 1 part composted landscape soil shall also have added 6 parts of coarse washed sand.

- G. Seeding. Seed all areas shown within contract limits as specified as well as all other areas disturbed during construction. All areas to be seeded shall be loosened and fine raked to break up lumps and produce a smooth, even grade free from all unsightly variations, ridges or depressions. Remove stones 1 inch or larger, sticks, roots, or other debris that is exposed during this operation. All fine grading shall be subject to observation by the Construction Observer/Inspector.
 - 1. Broadcast Seeding
 - a. The seed or seed mixture, in the quantity specified, shall be uniformly distributed over the areas shown on the plans or where directed by the ENGINEER. If the sowing of seed is by hand, rather than by mechanical methods, the seed shall be sown in two directions at right angles to each other. If mechanical equipment is used, all varieties of seed as well as fertilizer, may be distributed simultaneously provided that each component is uniformly applied at the specified rate. When seed and fertilizer are to be distributed as a water slurry, the mixture shall be applied to the area to be seeded within 30 minutes after components are placed in the equipment. After planting, the planted area shall be rolled with a light corrugated drum roller or another type of roller approved by the ENGINEER. All rolling of the sloped areas shall be along the contour of the slopes.

 - b. The pure live seed planted per acre shall be of the type specified in Table 1 for rural areas (clay soils), Table 2 for rural areas (sandy soils).

Table 1

Planting Dates	Common Names	Mixture & Rate For Clay soils (lbs./acre)
Feb. 1 - May 1	Green Sprangletop	0.7
	Bermudagrass	0.9
	Sideoats Grama	2.2
	Little Bluestem	1.4
	Indiangrass	1.8

Table 2

Planting Dates	Common Names	Mixture & Rate For Clay soils (lbs./acre)
Feb. 1 - May 1	Green Sprangletop	1.1
	Bermudagrass	1.5
	Sand Dropseed	0.4

2. Straw or Hay Mulch Seeding

- a. The seed or seed mixture, in the quantity specified, shall be uniformly distributed over the areas shown on the plans or where directed by the ENGINEER. If the sowing of seed is by hand, rather than by mechanical methods, the seed shall be sown in two directions at right angles to each other. If mechanical equipment is used, all varieties of seed, as well as fertilizer, may be distributed simultaneously provided that each component is uniformly applied at the specified rate. When seed and fertilizer are to be distributed as a water slurry, the mixture shall be applied to the area to be seeded within 30 minutes after all components are placed in the equipment.
- b. Immediately upon completion of planting of the seed, straw or hay mulch shall be spread uniformly over the seeded area at the rate of approximately 1.5 to 2.0 tons of hay mulch or 2.0 to 2.5 tons of straw mulch per acre. When a mulching machine is used it must

be approved by the ENGINEER and may be equipped to inject a tacking agent into the straw or hay mulch uniformly as it leaves the equipment at a rate of 0.05 to 0.10 gallon of tacking agent per square yard of mulched area. When the tacking agent is placed by hand, then the rate of application for the tacking agent shall be approximately 0.15 gallon per square yard.

3. Cellulose Fiber Mulch Seeding

- a. The seed or seed mixture, in the quantity specified, shall be uniformly distributed over the areas shown on the plans or where directed by the ENGINEER. If the sowing of seed is by hand, rather than by mechanical methods, the seed shall be sown in two directions at right angles to each other. If mechanical equipment is used all varieties of seed, as well as fertilizer, may be distributed simultaneously, provided that each component is uniformly applied at the specified rate. When seed and fertilizer are to be distributed as a water slurry, the mixture shall be applied to that area to be seeded within 30 minutes after all components are placed in the equipment.
- b. Immediately upon completion of planting of the seed, cellulose fiber mulch shall be spread uniformly over the seeded area at the following rates:
 - (1) Sandy soils with 3:1 slope or less - min. 2000 lbs./acre
 - (2) Sandy soils with greater than 3:1 slope - min. 2300 lbs./acre
 - (3) Clay soils with 3:1 slope or less - min. 2500 lbs./acre
 - (4) Clay soils with greater than 3:1 slope - min. 3000 lbs./acre
- c. Cellulose fiber mulch rates are based on dry weight of mulch per acre. When used, a mulching machine, approved by the ENGINEER, shall be equipped to eject the thoroughly wet mulch material at a uniform rate to provide the mulch coverage specified.

4. Seeding for Cool Season Temporary Erosion Control.

- a. Standard Seeding. When specified on the plans or directed by the ENGINEER, temporary erosion control measures shall be performed. These measures shall consist of the sowing of seed

mixtures appropriate for the season and the work and materials as required in this section. These measures shall be performed over the areas shown on the plans or where directed by the ENGINEER. The pure live seed, of the cool season plants, planted per acre shall be of the type specified, with the mixture, rate and planting as follows in Table 3, except as shown on the plans.

Table 3

Optimum Planting Dates	Common Name	Rate, lbs./acre
September 1 - November 30	Tall Fescue	4.0
	Oats	21.0*
	Wheat (Red, Winter)	30.0

* May substitute Barley at 72,0 lb./acre divided by the number of species in the mix.

5. Seeding for Warm Season Temporary Erosion Control. When specified on the plans or directed by the ENGINEER, temporary erosion control measures shall be performed. This measure shall consist of the sowing of seed appropriate for the season and the work and materials as required in this section. These measures shall be performed over the areas shown on the plans or where directed by the ENGINEER. The pure live seed planted per acre shall be of the type specified, rate and seed planting date as follows in Table 4 except as shown on the plans.

Table 4

Optimum Planting Dates	Common Name	Rate, lbs./acre
May 1 - August 31	Foxtail Millet	30.0

H. Sodding.

1. Block Sodding. At locations shown on plans or where directed by the Inspector, sod blocks shall be carefully placed on the prepared areas. The fertilizer shall then be applied and thoroughly watered. When sufficiently dry, the sodded area shall be rolled or tamped to form a thoroughly compacted, solid mat. Any voids left in the block sodding shall be filled with additional sod and tamped.
2. Sequence of Sodding: It is the intent of this specification that all sodding be placed and watered twice a week, unless intervening rains make watering

unnecessary. Watering shall be required for at least thirty (30) days after planting to establish growth or until acceptance of the work by the City. If the season is inappropriate, the Inspector may require that the sodding operations be advanced or retarded as may seem advisable. All areas shall be covered with live sod before final acceptance. Any blocks which show no signs of life shall be replaced with live sod before the work shall be measured for payment.

I. Mulching

1. Mulch tree planting pits with required mulching material 2" deep immediately after planting. Thoroughly water mulched areas. After watering, rake mulch to provide a uniform finished surface.
2. Straw or Hay Mulching. Mulch shall be spread uniformly over the area indicated on plans or as designated by the ENGINEER at the rate of approximately 1.5 to 2.0 tons of hay mulch or 2.0 to 2.5 tons of straw mulch per acre. When used, a mulching machine approved by the ENGINEER shall be equipped to inject a tacking agent into the straw or hay mulch uniformly as it leaves the equipment at a rate of 0.05 to 0.10 gallon of tacking agent per square yard of mulched area. If the straw or hay mulch and tacking agent are placed by hand, then the rate of application for the tacking agent shall be approximately 0.15 gallon per square yard.

J. Guying/Staking

1. Stake/guy all newly installed trees immediately after seeding operations and prior to acceptance. When high winds or other conditions which may effect tree survival or appearance occur, the ENGINEER may require immediate staking/guying.
2. Stake deciduous trees under 3" caliper. Stake evergreen trees under 8' - 0" tall.

- K. Pruning. Prune branches of deciduous stock, after planting, to balance the loss of roots and preserve the natural character appropriate to the particular plant requirements. In general, remove ¼ to 1/3 of the leaf bearing buds, proportion in all cases. Remove or cut back broken, damaged, and asymmetrical growth of new wood.

3.02 TRANSPLANTING

- A. Remove existing plantings identified for transplant prior to beginning Work in area in accordance with standard nursery practices and as specified herein.
- B. Nondormant Plants: Prior to digging, spray foliage with antidesiccant, as recommended by manufacturer.
- C. Cover balls and containers of plants that cannot be planted immediately with moist soil or mulch.
- D. Water plants as often as necessary to prevent drying until planted.
- E. Bare Roots Plants are not acceptable.
- F. Replant each temporarily removed tree only after construction activities are completed and applicable grading and topsoil replacement is completed in its vicinity. Replant trees in their new locations as directed by the OWNER.

3.03 FERTILIZER

Newly Planted and Relocated Trees:

1. Fertilization of new and relocated trees shall be accomplished after soil preparation work is complete in accordance with the following specifications:
 - a. Concentration of suspension to be 40 pounds of fertilizer for trees in each 100 gallons of water. Application rate shall be 6 pounds of actual nitrogen per 1000 square feet of area under dripline.
 - b. Suspended tree fertilizer applied with a standard hydrant sprayer at a pressure of 100 to 200 psi shall be injected in slightly slanted holes approximately 12 inches in depth. Injection time at full concentration is 3 to 4 seconds; at half concentration (20 pounds per 100 gallons) for 6 to 8 seconds.
 - c. Suspended tree fertilizer is to be applied in both the planting pit and the parent undisturbed soil surrounding the pit.
 - d. Apply suspended tree fertilizer at tree ball within the tree pit at full concentration. In parent soil 12 inches beyond the edge of the pit with holes made at 1-1/2 to 2 feet on center inject half concentration mixture.
2. Liquid fertilization within the tree pit shall be injected according to the following schedule:
 - a. Trees 1 to 2" Caliper: One Trees 1 to 2" Caliper: One (1) injection

- b. Trees 2-1/2 to 3-1/2" Caliper: Two (2) injections
 - c. Trees 4 to 5-1/2" Caliper: Three (3) injections
 - d. Trees 6" and Greater Caliper: Inject at 3 feet on center in concentric circles around tree with last ring located at drip line. First ring to be located at edge of root ball.
3. Area beneath dripline of the trees is to be well watered after the fertilization is placed.

3.04 MAINTENANCE

- A. Maintain planting until completion and Final Acceptance of the entire Project.
- B. Re-set settled plants to proper grade and position. Restore planting saucer and adjacent material and remove dead material.
- C. Tighten and repair guy wire and stakes as required.
- D. Correct defective work as soon as possible after deficiencies become apparent and weather and season permit.
- E. Water trees and plants within the first twenty four (24) hours of initial planting, and not less than twice per week until Final Acceptance.
- F. Maintain seeded areas until completion and Final Acceptance of the entire project by the OWNER.
- G. Maintain seeded areas until a full, uniform stand of grass free of weed, undesirable grass species, disease and insects is achieved and accepted by the OWNER.

3.05 ACCEPTANCE

- A. Field observation to determine recommendations on acceptance of planted areas will be made by the Construction Observer/Inspector, upon the Contractor's request. Provide notification at least ten (10) working days before field observation date.
- B. Field observations to determine recommendations on acceptance of seeded area will be made by the Construction Observer/Inspector upon Contractor's request. Provide notification at least ten (10) working days before requested field observation. Seeded areas will be acceptable to the OWNER provided all requirements, including maintenance, have been complied with and a healthy,

even colored viable grassed area is established, free of weeds, undesirable grass species, disease and insects.

3.06 FINISHING

Where applicable, the shoulders, slopes, and ditches shall be smoothed after planting has been completed and shaped to conform to the cross-section previously provided and existing at the time seeding operations were begun. Any excess dirt from the planting operations shall be spread uniformly over adjacent areas or disposed of as directed by the ENGINEER so that the completed surfaces will present a sightly appearance.

3.07 CLEANING

Perform cleaning during installation of the work and upon completion of the work. Remove from site all excess material, soil, debris and equipment. Repair damage resulting from planting operations.

END OF SECTION

SECTION 02481

TREE AND LANDSCAPE PROTECTION

PART 1 - GENERAL:

This item shall govern the placing of protection for trees and other landscape plant material or natural areas to be protected during construction. No site preparation work shall begin in areas where tree preservation and treatment measures have not been completed and approved. *Where removal of trees is indicated on the drawings, they shall be marked as directed by the engineer or designated representatives.* This item shall also govern the excavation, filling, *trenching and boring* around trees described on the plans, and for furnishing all materials, water, labor, tools, equipment and supplies required as specified by this item or as indicated on the plans.

Reference Standards: City of San Antonio Tree Preservation ordinance # **85262**

1.01 MATERIALS:

A. LEVEL I FENCE PROTECTION:

Fabric: Fabric (4 foot height or 1.2 m) shall consist of orange plastic fencing as shown on the plans and shall be woven with 2-inch (50 mm) mesh openings such that in a vertical dimension of 23 inches (584 mm) along the diagonals of the openings there shall be at least seven meshes.

1. Installation Posts: Installation posts shall be a minimum of 72 inches (1.5 m) long and steel "T" shaped with a minimum weight of 1.3 pounds per linear foot (6.3 kg per meter).
2. Tie Wire: Wire for attaching the fabric to the t-posts shall be not less than No. 12 gauge galvanized wire. Sufficient fastening material shall be furnished to provide for the securing of the fabric to the "T" line posts.
3. Used Materials: Previously-used materials, meeting the above requirements and when approved by the Engineer, may be used.

B. LEVEL IIA FENCE PROTECTION:

Materials same as Level I -OR-

C. LEVEL IIB FENCE PROTECTION:

1. Sleeve: 2x4 lumber to a height of 4 feet above the root crown.
2. 2x4 shall be utilized as called for on plan.
3. Tie Wire: Wire for securing the 2x4s shall not be less than No. 12 gauge.

D. OTHER MATERIALS:

1. Tree Dressing - Asphaltic Tree Wound Paint
2. Dry Wells – Native Stone Wall or Concrete Segmental Retaining Wall System.
3. Paving – Permeable segmented pavers in conjunction with PVC pipe aeration system or concrete on gravel base with cored holes or suspended concrete slab.

4. Schedule 40 PVC Wheel and Spoke Venting System
5. Vertical Venting Systems-Schedule 40 PVC Pipe w/Fertilizer Basket and Cap or Metal Pipe w/Cap.

1.02 CONSTRUCTION METHODS:

A. LEVEL I FENCE PROTECTION:

1. All trees and shrubs in the proximity of the construction site shall be carefully checked for injuries prior to beginning any development activity.
2. Protective fencing shall be erected at locations shown in the plans or as directed by the Inspector and/or City Arborist or in accordance with the details shown on the plans at the drip line of trees (Root Protection Zone, RPZ) and/or landscape plant material including natural areas. Fencing shall be maintained and repaired by the contractor during site construction.
3. Protective fence locations in close proximity to street intersections or drives shall adhere to the City of San Antonio's site distance criteria.
4. The protective fencing shall be erected before site work commences and shall remain in place during the entire construction phase. Access to fenced areas will be permitted only with the approval of the engineer.
5. The installation posts will be placed every 6 feet (2 m) around the drip line or RPZ and embedded to 18 inches (457 mm) deep. Fabric attachment shall be attached to the installation posts by the use of sufficient wire ties to securely fasten the fabric to the "T" posts as to hold the fabric in a stable and upright position.
 - a. Do not clear, fill or grade in the RPZ of any tree.
 - b. Do not store, stockpile or dump any job material, soil or rubbish under the spread of the tree branches.
 - c. Do not park or store any equipment or supplies under the spread of the tree branches.
 - d. Do not set up any construction operations under the spread of the tree branches. (E.g. pipe cutting and threading, mortar mixing, painting or lumber cutting)
 - e. Do not nail or attach temporary signs, meters, switches, wires, bracing or any other item to the trees.
 - f. Do not permit runoff from waste materials including solvents, concrete washouts, asphalt tack coats (MC-30 oil), etc. to enter the RPZ. Barriers are to be provided to prevent such runoff substances from entering the RPZ whenever possible, including in an area where rain or surface water could carry such materials to the root system of the tree.

B. The contractor shall avoid cutting roots larger than one inch in diameter when excavation occurs near existing trees. Excavation in the vicinity of trees shall proceed with caution. The contractor shall contact the city inspector.

C. Remove all trees, shrubs or bushes to be cleared from protected root zone areas as directed by engineer by hand.

- D. Trees damaged or lost due to contractor's negligence during construction shall be mitigated at the contractor's expense and to the engineer's satisfaction.
- E. Any tree removal shall be approved by the city arborist prior to its removal.
- F. Cover exposed roots at the end of each day with soil, mulch or wet burlap.
- G. In critical root zone areas that cannot be protected during construction and where heavy traffic is anticipated, cover those areas with (8) inches of organic mulch to minimize soil compaction. This (8) inch depth of mulch shall be maintained throughout construction.
- H. Water all trees, most heavily impacted by construction activities, deeply once a week during periods of hot dry weather. Spray tree crowns with water periodically to reduce dust accumulation on the leaves.
- I. When installing concrete adjacent to the root zone of a tree, use a plastic vapor barrier behind the concrete to prohibit leaching of lime into the soil. See related specifications.
- J. When an excavation or embankment is placed within the dripline of any tree greater than (8) inches in diameter, a Tree well shall be constructed to protect the tree as indicated, when the cut or fill exceeds (8) inches. See related specifications.
- K. Where paving or filling is necessary within the dripline of any tree (8) inches or greater, a permeable pavement and aeration system must be installed as indicated. See related specifications.

1.03 CONSTRUCTION METHODS:

- A. **LEVEL II FENCE PROTECTION:**
 - 1. Fabric: Fabric (4 foot height or 1.2 m) shall consist of orange plastic fencing as shown on the plans and shall be woven with 2-inch (50 mm) mesh openings such that in a vertical dimension of 23 inches (584 mm) along the diagonals of the openings there shall be at least seven meshes.
 - 2. Installation Posts: Installation posts shall be a minimum of 72 inches (1.5 m) long and steel "T" shaped with a minimum weight of 1.3 pounds per linear foot (6.3 kg per meter).
 - 3. Tie Wire: Wire for attaching the fabric to the t-posts shall be not less than No. 12 gauge galvanized wire. Sufficient fastening material shall be furnished to provide for the securing of the fabric to the "T" line posts.
 - 4. Used Materials: Previously-used materials, meeting the above requirements and when approved by the Engineer, may be used.

END OF SECTION

SECTION 02910

SOIL PREPARATION

PART 1 GENERAL

1.01 SUBMITTALS

Shop Drawings: Product labels/data sheets.

1.02 SEQUENCING AND SCHEDULING

Rough grade areas to be planted or seeded. Perform Work specified in Section 02200, SITE PREPARATION.

PART 2 PRODUCTS

2.01 TOPSOIL

- A. General: Natural, friable, sandy loam, obtained from well-drained areas, free from objects larger than 1-1/2 inches maximum dimension, and free of subsoil, roots, grass, other foreign matter, hazardous or toxic substances, and deleterious material that may be harmful to plant growth or may hinder grading, planting, or maintenance.
- B. Organic Matter: Minimum 1.5 percent by dry weight as determined in accordance with USBR 514.8.7-82.
- C. pH: Range 6.0 to 7.2.
- D. Textural Amendments: Amend as necessary to conform to required composition by incorporating sand, peat, manure, or sawdust.
- E. Source: Stockpile material onsite, in accordance with Section 02200, SITE PREPARATION and related requirements. Import topsoil if onsite material fails to meet specified requirements or is insufficient in quantity.

2.02 SAWDUST OR GROUND BARK

Nontoxic, of uniform texture, and subject to slow decomposition when mixed with soil. Nitrogen-treated, or if untreated mix with minimum 0.15 pounds of ammonium nitrate or 0.25 pounds of ammonium sulfate per cubic foot of loose material.

2.03 PEAT

Composition: Natural residue formed by decomposition of reeds, sedges, or mosses in a freshwater environment, free from lumps, roots, and stones.

- A. Organic Matter: Not less than 90 percent on a dry weight basis as determined by USBR 514.8.7-82.
- B. Moisture Content: Maximum 65 percent by weight at time of delivery.

2.04 FERTILIZER

- A. Manure: Well-rotted, stable or cattle manure, free from weed seed and refuse. Maximum 50 percent sawdust or shavings by volume.
- B. Age: Minimum 4 months; maximum 2 years.

2.05 SAND

Fine Aggregate: Clean, coarse, well-graded, ASTM C33-90.

PART 3 EXECUTION

3.01 SUBGRADE PREPARATION

- A. Remove any temporary construction facilities such as haul roads, construction material stockpiles, etc. prior to scarifying the subgrade.
- B. Scarify subgrade to minimum depth of 6 inches where topsoil is to be placed.
- C. Remove stones over 2-1/2 inches in any dimension, sticks, roots, rubbish, and other extraneous material.
- D. Limit preparation to areas that will receive topsoil within 2 days after preparation.

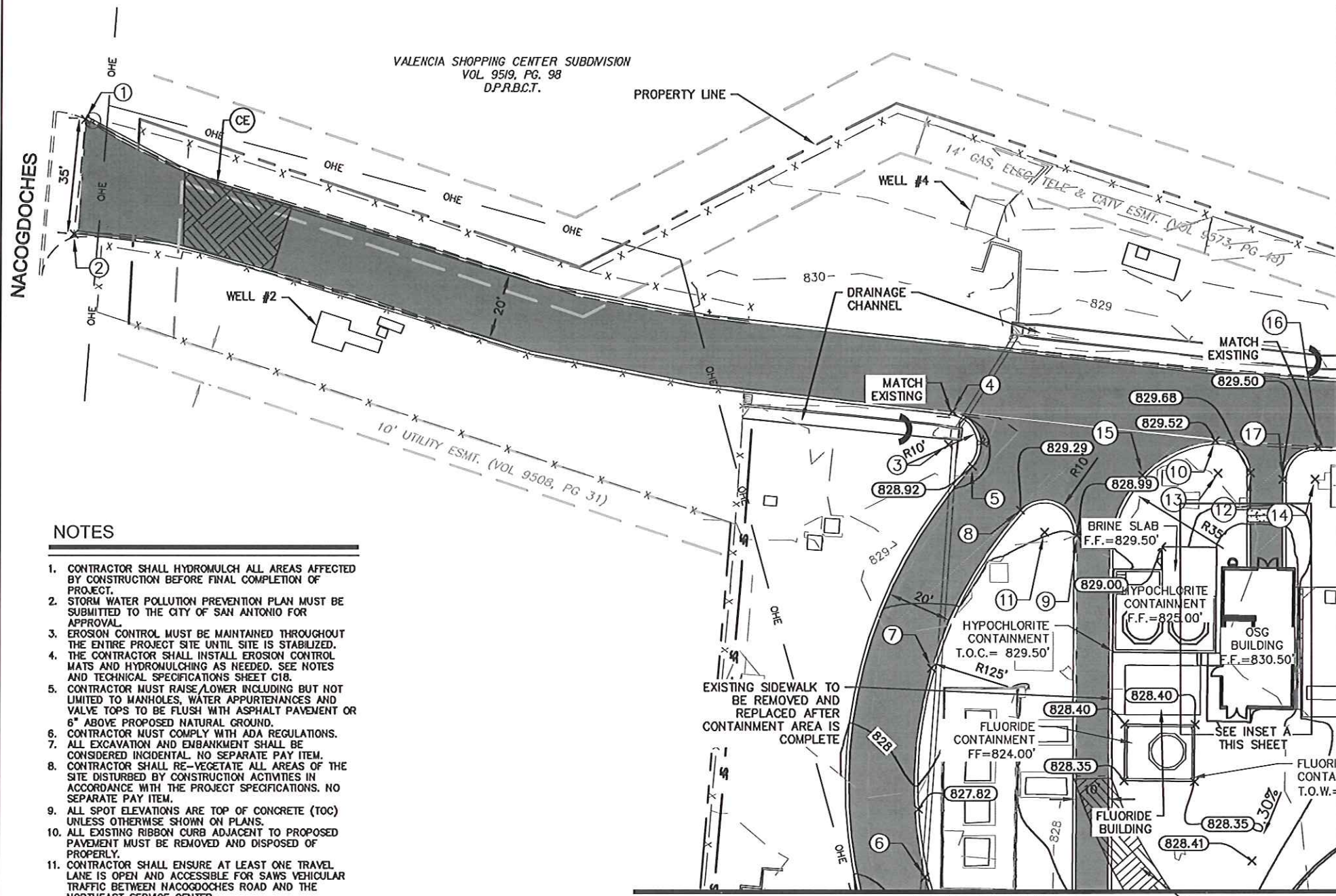
3.02 TOPSOIL PLACEMENT

- A. Do not place topsoil when subsoil or topsoil is frozen, excessively wet, or otherwise detrimental to the Work.
- B. Mix soil amendments, lime, and fertilizer with topsoil before placement or spread on topsoil surface and mix thoroughly into entire depth of topsoil before planting or seeding. Delay mixing of fertilizer if planting or seeding will not occur within 3 days.
- C. Place 1/2 of total depth of topsoil and work into top 4 inches of subgrade soil to create a transition layer. Place remainder of topsoil to depth of 12 inches after compacting to 75 percent where seeding and planting are scheduled.
- D. Uniformly distribute to within 1/2-inch of final grades. Fine grade topsoil eliminating rough or low areas and maintaining levels, profiles, and contours of subgrade.
- E. Remove stones exceeding 1-1/2 inches, roots, sticks, debris, and foreign matter during and after topsoil placement.
- F. Remove surplus subsoil and topsoil from site. Grade stockpile area as necessary and place in condition acceptable for planting or seeding.

END OF SECTION

VALENCIA SHOPPING CENTER SUBDIVISION
VOL. 9519, PG. 98
D.P.R.B.C.T.

NACOGDOCHES



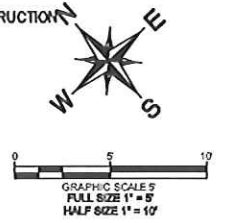
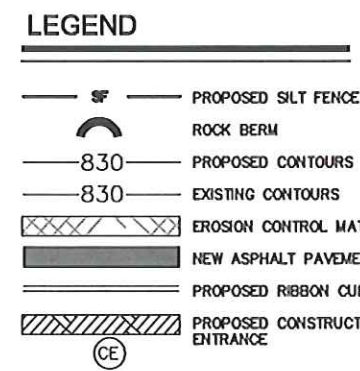
NOTES

1. CONTRACTOR SHALL HYDROMULCH ALL AREAS AFFECTED BY CONSTRUCTION BEFORE FINAL COMPLETION OF PROJECT.
2. STORM WATER POLLUTION PREVENTION PLAN MUST BE SUBMITTED TO THE CITY OF SAN ANTONIO FOR APPROVAL.
3. EROSION CONTROL MUST BE MAINTAINED THROUGHOUT THE ENTIRE PROJECT SITE UNTIL SITE IS STABILIZED.
4. THE CONTRACTOR SHALL INSTALL EROSION CONTROL MATS AND HYDROMULCHING AS NEEDED. SEE NOTES AND TECHNICAL SPECIFICATIONS SHEET C18.
5. CONTRACTOR MUST RAISE/LOWER INCLUDING BUT NOT LIMITED TO MANHOLES, WATER APPURTENANCES AND VALVE TOPS TO BE FLUSH WITH ASPHALT PAVEMENT OR 6" ABOVE PROPOSED NATURAL GROUND.
6. CONTRACTOR MUST COMPLY WITH ADA REGULATIONS.
7. ALL EXCAVATION AND EMBANKMENT SHALL BE CONSIDERED INCIDENTAL. NO SEPARATE PAY ITEM.
8. CONTRACTOR SHALL RE-VEGETATE ALL AREAS OF THE SITE DISTURBED BY CONSTRUCTION ACTIVITIES IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS. NO SEPARATE PAY ITEM.
9. ALL SPOT ELEVATIONS ARE TOP OF CONCRETE (TOC) UNLESS OTHERWISE SHOWN ON PLANS.
10. ALL EXISTING RIBBON CURB ADJACENT TO PROPOSED PAVEMENT MUST BE REMOVED AND DISPOSED OF PROPERLY.
11. CONTRACTOR SHALL ENSURE AT LEAST ONE TRAVEL LANE IS OPEN AND ACCESSIBLE FOR SAWS VEHICULAR TRAFFIC BETWEEN NACOGDOCHES ROAD AND THE NORTHEAST SERVICE CENTER.

COORDINATE TABLE			
Point #	Northing	Eastng	Description
1	13756571.80	2163960.68	EOP DRIVEWAY
2	13756548.06	2163934.73	EOP DRIVEWAY
3	13756320.68	2164091.53	CENTER OF 10' RADIUS
4	13756327.18	2164099.13	PC OF 10' RADIUS MATCH EX.
5	13756310.73	2164092.51	PT OF 10' RADIUS
6	13756226.78	2163997.15	PT OF 125' RADIUS
7	13756273.22	2164041.65	MIDPOINT OF 125' RADIUS
8	13756290.83	2164094.52	PC OF 125' RADIUS / PT OF 10' RADIUS
9	13756273.54	2164102.30	PC OF 10' RADIUS
10	13756266.48	2164153.21	PC OF 35' RADIUS / PT OF 10' RADIUS

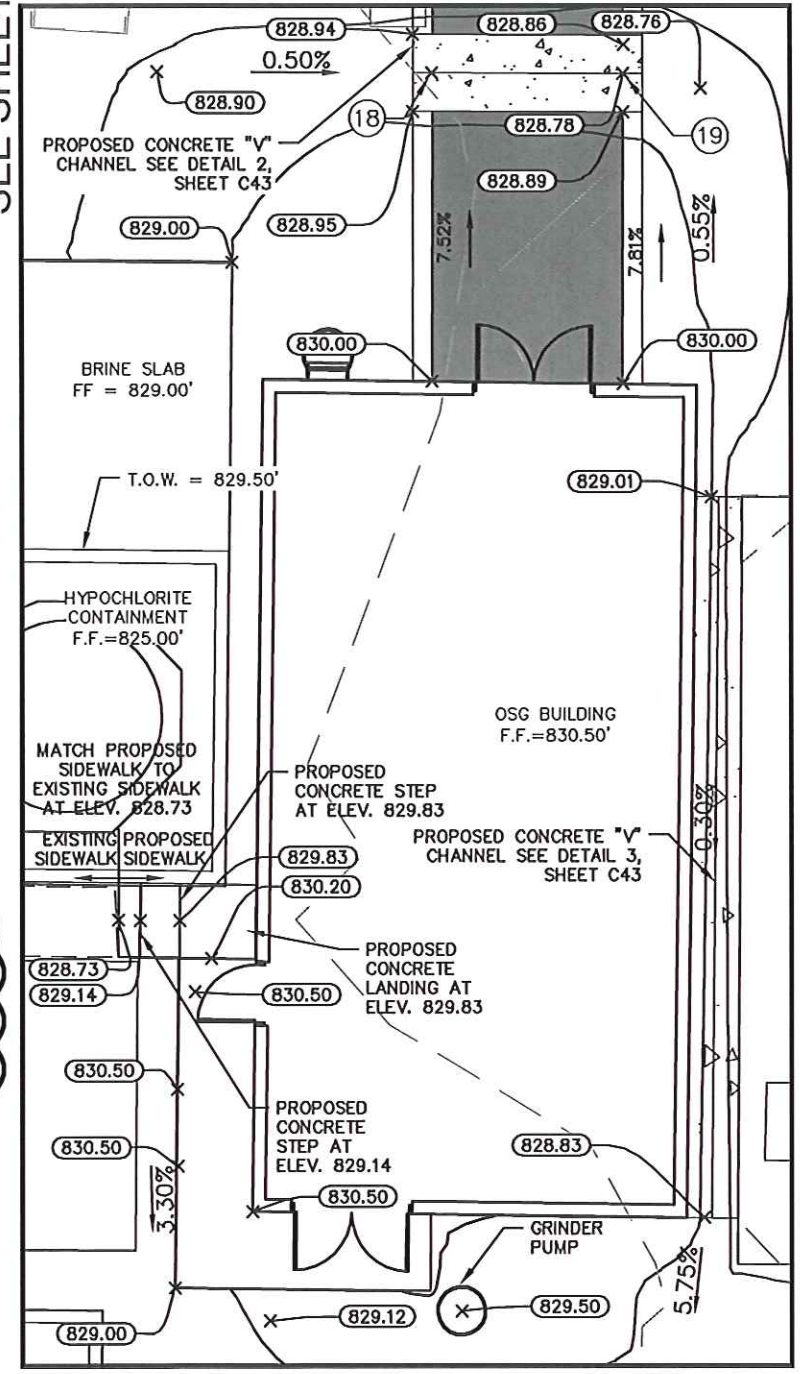
COORDINATE TABLE			
Point #	Northing	Eastng	Description
11	13756280.88	2164095.49	CENTER OF 10' RADIUS
12	13756251.94	2164154.69	PC OF 10' RADIUS
13	13756258.52	2164147.18	CENTER OF 10' RADIUS
14	13756237.04	2164168.17	CENTER OF 10' RADIUS
15	13756273.72	2164129.61	MIDPOINT OF 35' RADIUS
16	13756243.85	2164175.50	PC OF 10' RADIUS MATCH EX.
17	13756243.74	2164180.75	PT OF 10' RADIUS
18	13756242.32	2164145.98	VALLEY GUTTER FLOW LINE
19	13756235.60	2164153.37	VALLEY GUTTER FLOW LINE

SPECIAL NOTE:
ELEVATION LABELS WERE ADDED TO EXISTING CONTOURS FOR CLARITY PURPOSES.



MATCH LINE
SEE SHEET C20

MATCH LINE
SEE SHEET C22



INSET A

Kimley-Horn and Associates, Inc.
Firm Registration No. 027
101 West Loop at U. of Texas Blvd., San Antonio, TX 78260-2704-51916
No. 101
Revision
By
Date

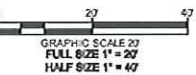


SAN ANTONIO WATER SYSTEM
NACO PUMP STATION IMPROVEMENTS PROJECT

GRADING, PAVING & EROSION CONTROL
(2 OF 5)

Scale: AS SHOWN
Designed by: VRS
Drawn by: MAV
Checked by: FCW
Date: FEBRUARY 2014
Project No.: 08665010
SAWS No.: 12-6003

VALENCIA SHOPPING CENTER SUBDIVISION
VOL. 9519, PG. 98
D.P.R.B.C.T.



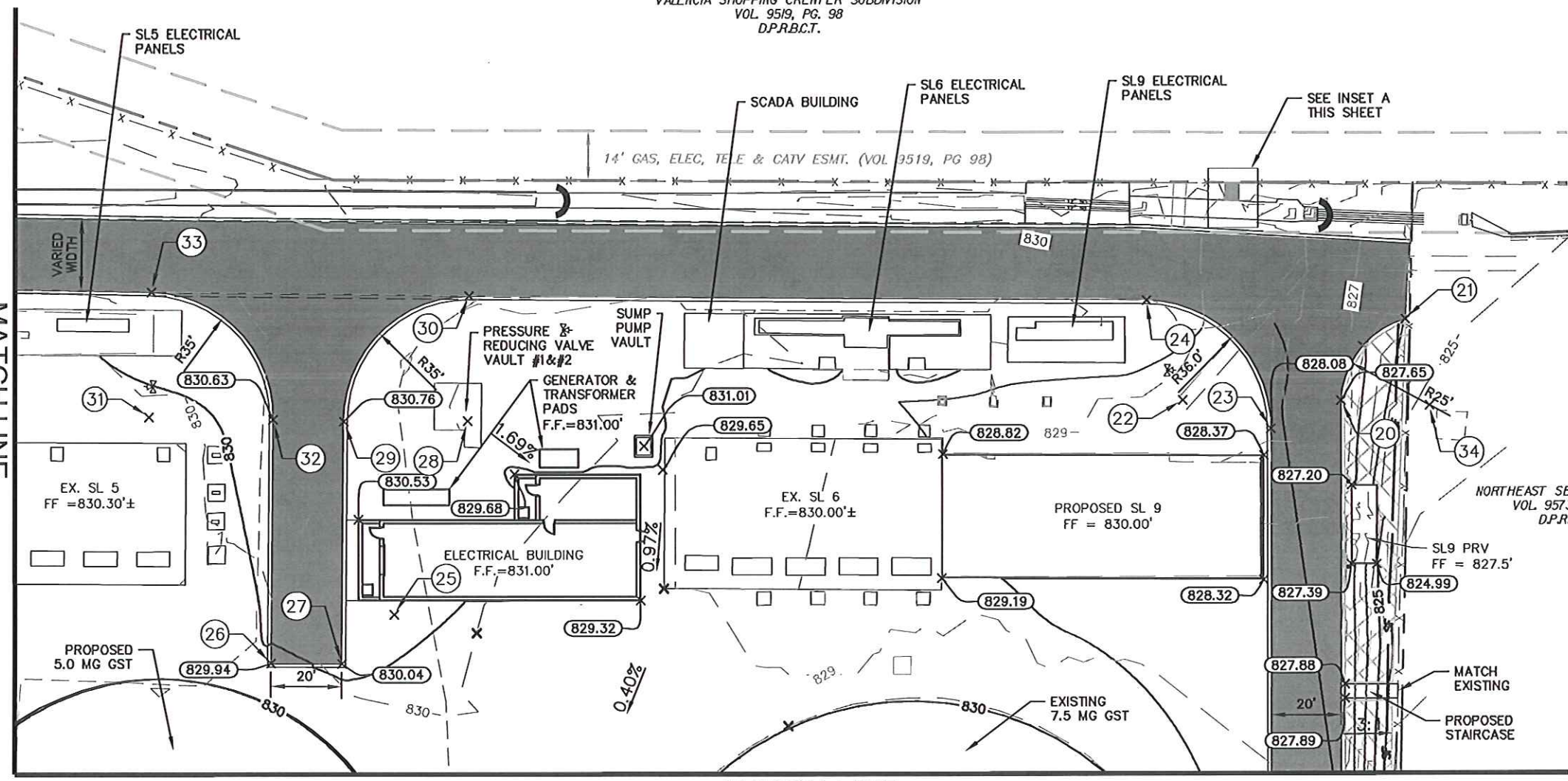
LEGEND

- PROPOSED SILT FENCE
- ROCK BERM
- PROPOSED CONTOURS
- EXISTING CONTOURS
- EROSION CONTROL MATS
- NEW ASPHALT PAVEMENT
- PROPOSED RIBBON CURB

NOTES

1. CONTRACTOR SHALL HYDROMULCH ALL AREAS AFFECTED BY CONSTRUCTION BEFORE FINAL COMPLETION OF PROJECT.
2. STORM WATER POLLUTION PREVENTION PLAN MUST BE SUBMITTED TO THE CITY OF SAN ANTONIO FOR APPROVAL.
3. EROSION CONTROL MUST BE MAINTAINED THROUGHOUT THE ENTIRE PROJECT SITE UNTIL SITE IS STABILIZED. THE CONTRACTOR SHALL INSTALL EROSION CONTROL MATS AND HYDROMULCHING AS NEEDED. SEE NOTES AND TECHNICAL SPECIFICATIONS SHEET C18.
5. CONTRACTOR MUST RAISE/LOWER INCLUDING BUT NOT LIMITED TO MANHOLES, WATER APPURTENANCES AND VALVE TOPS TO BE FLUSH WITH ASPHALT PAVEMENT OR 6" ABOVE PROPOSED NATURAL GROUND.
6. CONTRACTOR MUST COMPLY WITH ADA REGULATIONS.
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11. CONTRACTOR SHALL ENSURE AT LEAST ONE TRAVEL LANE IS OPEN AND ACCESSIBLE FOR SAWS VEHICULAR TRAFFIC BETWEEN NACOGDOCHES ROAD AND THE NORTHEAST SERVICE CENTER.

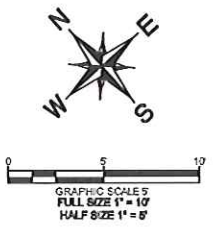
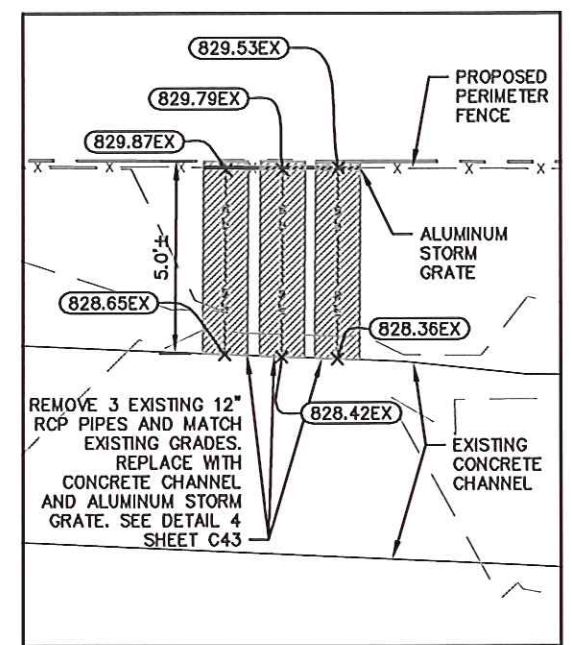
MATCH LINE
SEE SHEET C19



MATCH LINE
SEE SHEET C21

Point #	Northing	Easting	Description
20	13755965.35	2164437.82	PT OF 25' RADIUS
21	13755970.13	2164468.55	PC OF 25' RADIUS MATCH EX.
22	13755995.56	2164404.48	CENTER OF 25' RADIUS
23	13755972.89	2164417.68	PT OF 36' RADIUS
24	13756023.13	2164415.77	PC OF 36' RADIUS MATCH EX.
25	13756099.67	2164198.97	CENTER OF GRINDER PUMP
26	13756112.72	2164163.87	EOP DRIVEWAY
27	13756099.22	2164178.62	EOP DRIVEWAY
28	13756126.24	2164250.80	CENTER OF 35' RADIUS
29	13756149.55	2164224.69	PT OF 35' RADIUS
30	13756151.99	2164274.50	PC OF 35' RADIUS MATCH EX.
31	13756187.29	2164184.67	CENTER OF 35' RADIUS
32	13756163.39	2164210.25	PT OF RADIUS 35'
33	13756212.84	2164208.59	PC OF 35' RADIUS MATCH EX.
34	13755947.69	2164455.53	CENTER OF 25' RADIUS

SPECIAL NOTE:
ELEVATION LABELS WERE ADDED TO EXISTING CONTOURS FOR CLARITY PURPOSES.



INSET A

Kimley-Horn and Associates, Inc.
Professional Engineer
No. 0011111111
By: [Signature]
Date: [Blank]



SAN ANTONIO WATER SYSTEM
NACO PUMP STATION IMPROVEMENTS PROJECT

GRADING, PAVING & EROSION CONTROL
(3 OF 5)

Scale:	AS SHOWN
Designed by:	VRS
Drawn by:	MAV
Checked by:	FCW
Date:	FEBRUARY 2014
Project No.:	08666010
SAWS No.:	12-003

SHEET
C20

PLOTTED BY: [Blank] DWG NAME: [Blank] LAST DATE: [Blank]

MATCH LINE
SEE SHEET C20

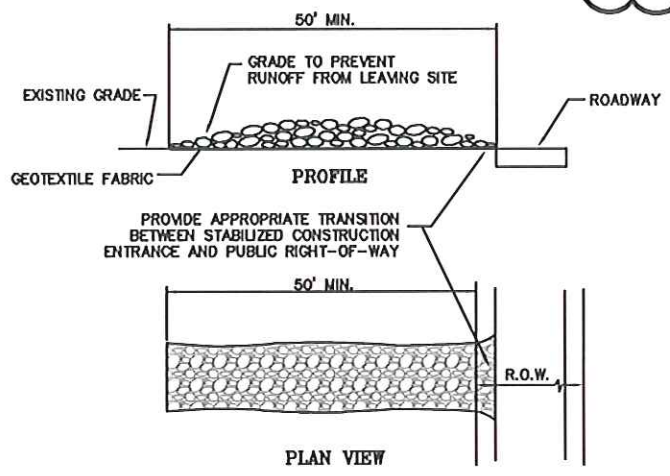
Point #	Northing	Eastng	Description
35	13755871.68	2164130.80	PC OF 580' RADIUS
36	13755932.78	2164239.88	CENTER OF 105' RADIUS
37	13755881.94	2164149.13	PT OF 105' RADIUS
38	13755882.35	2164317.76	PC OF 105' RADIUS

SPECIAL NOTE:
ELEVATION LABELS WERE ADDED TO EXISTING CONTOURS FOR CLARITY PURPOSES.



LEGEND

	PROPOSED SILT FENCE
	ROCK BERM
	PROPOSED CONTOURS
	EXISTING CONTOURS
	EROSION CONTROL MATS
	NEW ASPHALT PAVEMENT
	PROPOSED RIBBON CURB



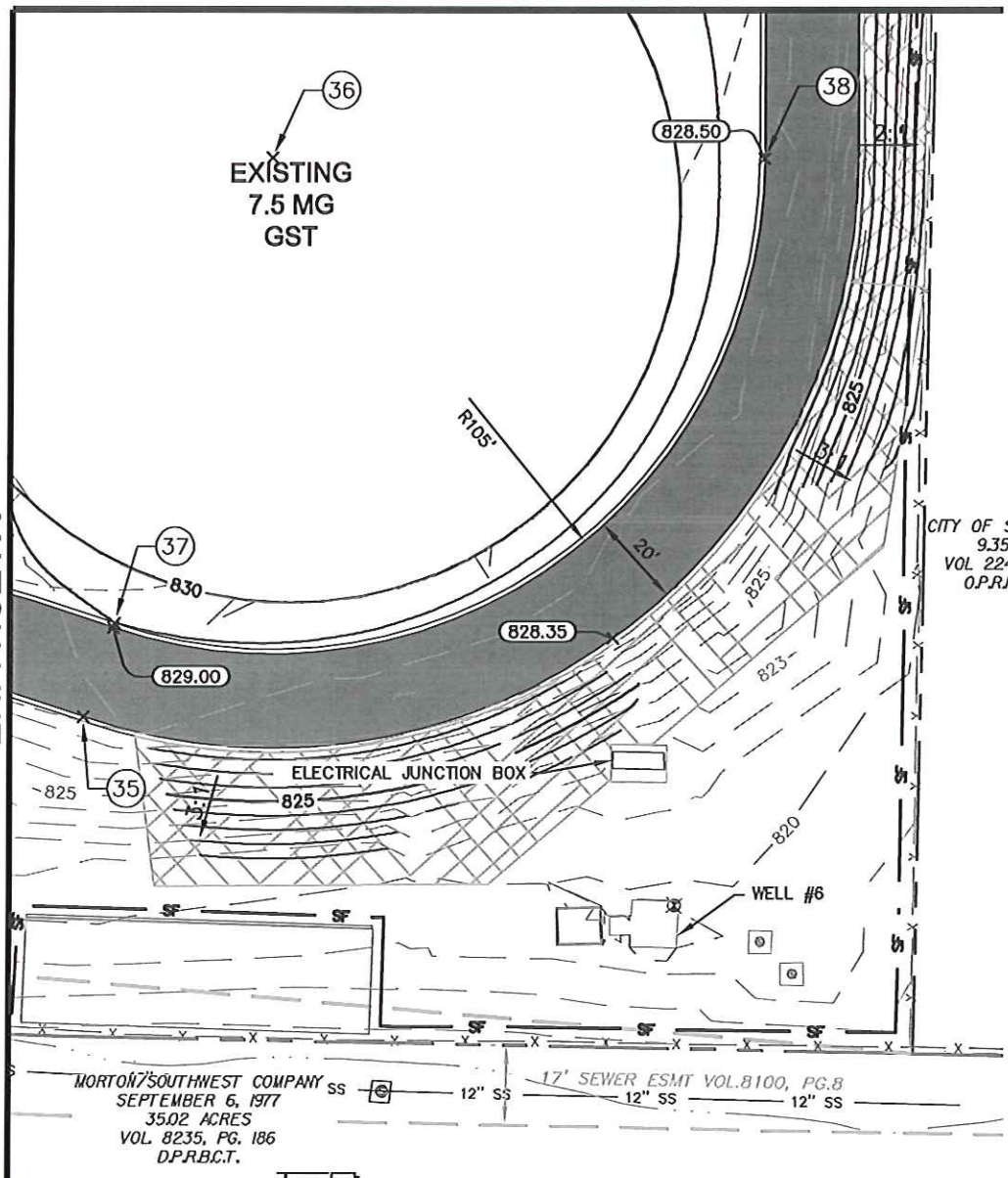
- TO BE LOCATED AT (CE) SYMBOL - SEE SHEET C19
- NOTES:**
- STONE SIZE - 4 TO 8 INCHES CRUSHED ROCK.
 - LENGTH - AS EFFECTIVE, BUT NOT LESS THAN 50 FEET.
 - THICKNESS - NOT LESS THAN 8 INCHES.
 - WIDTH - NOT LESS THAN FULL WIDTH OF ALL POINTS OF INGRESS OR EGRESS.
 - WASHING - WHEN NECESSARY, WHEELS SHALL BE CLEANED TO REMOVE SEDIMENT PRIOR TO ENTRANCE ONTO PUBLIC ROADWAY. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH CRUSHED STONE WHICH DRAINS INTO AN APPROVED TRAP OR SEDIMENT BASIN. ALL SEDIMENT SHALL BE PREVENTED FROM ENTERING ANY STORM DRAIN, DITCH OR WATERCOURSE USING APPROVED METHODS.
 - MAINTENANCE - THE ENTRANCE SHALL BE MAINTAINED IN CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC ROADWAYS. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND, AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC ROADWAY, MUST BE REMOVED IMMEDIATELY.
 - DRAINAGE - ENTRANCE MUST BE PROPERLY GRADED OR INCORPORATE A DRAINAGE SWALE TO PREVENT RUNOFF FROM LEAVING THE CONSTRUCTION SITE.
 - CONTRACTOR TO COORDINATE WITH OWNER EXACT LOCATION OF THIS DETAIL.

CONSTRUCTION ENTRANCE DETAIL

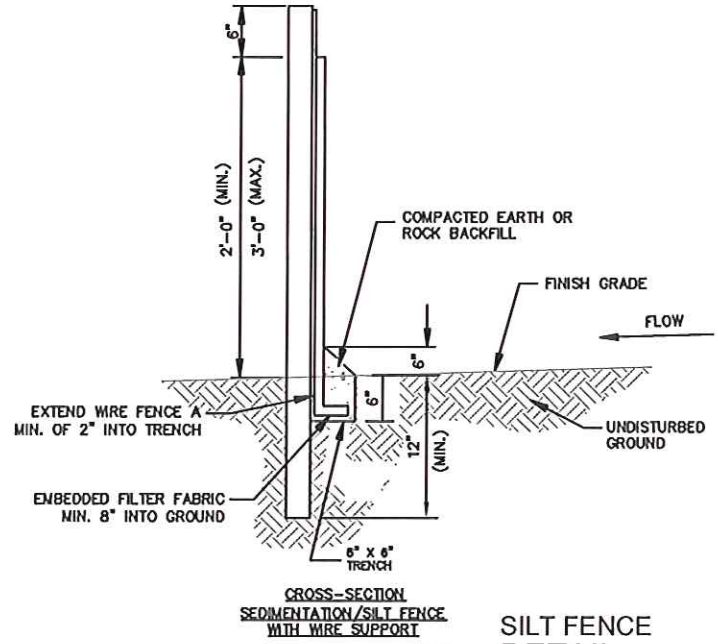
2

SCALE: NTS

- NOTES:**
- MATERIALS:**
- SILT FENCE MATERIAL SHOULD BE POLYPROPYLENE, POLYETHYLENE OR PLYAMIDE WOVEN OR NONWOVEN FABRIC. THE FABRIC WIDTH SHOULD BE 36 INCHES, WITH A MINIMUM UNIT WEIGHT OF 4.5 OZ/YD, MULLEN BURST STRENGTH EXCEEDING 180 LB/IN², ULTRAVIOLET STABILITY EXCEEDING 70%, AND MINIMUM APPARENT OPENING SIZE OF U.S. SIEVE NO. 30.
 - FENCE POSTS SHOULD BE MADE OF HOT ROLLED STEEL, AT LEAST 4 FEET LONG WITH TEE OR Y-BAR CROSS SECTION, SURFACE PAINTED OR GALVANIZED, MINIMUM NOMINAL WEIGHT 1.25 LB/FT², AND BRINDELL HARDNESS EXCEEDING 140.
 - WOVEN WIRE BACKING TO SUPPORT THE FABRIC SHOULD BE GALVANIZED 2" X 4" WELDED WIRE, 12 GAUGE MINIMUM.
- INSTALLATION:**
- STEEL POSTS, WHICH SUPPORT THE SILT FENCE, SHOULD BE INSTALLED ON A SLIGHT ANGLE TOWARD THE ANTICIPATED RUNOFF SOURCE. POST MUST BE EMBEDDED A MINIMUM OF 1-FOOT DEEP AND SPACED NOT MORE THAN 8 FEET ON CENTER. WHERE WATER CONCENTRATES, THE MAXIMUM SPACING SHOULD BE 6 FEET.
 - LAY OUT FENCING DOWN-SLOPE OF DISTURBED AREA, FOLLOWING THE CONTOUR AS CLOSELY AS POSSIBLE. THE FENCE SHOULD BE SITED SO THAT THE MAXIMUM DRAINAGE AREA IS 1/4 ACRE/100 FEET OF FENCE. SILT FENCE SHALL NOT BE PLACED IN CHANNEL OR WATERWAY.
 - THE TOE OF THE SILT FENCE SHOULD BE TRENCHED IN WITH A SPADE OR MECHANICAL TRENCHER, SO THAT THE DOWN-SLOPE FACE OF THE TRENCH IS FLAT AND PERPENDICULAR TO THE LINE OF FLOW. WHERE FENCE CANNOT BE TRENCHED IN (E.G., PAVEMENT OR ROCK OUTCROP), WEIGHT FABRIC FLAP WITH 3 INCHES OF PEA GRAVEL ON UPHILL SIDE TO PREVENT FLOW FROM SEEPING UNDER FENCE.
 - THE TRENCH MUST BE A MINIMUM OF 6 INCHES DEEP AND 6 INCHES WIDE TO ALLOW FOR THE SILT FENCE FABRIC TO BE LAID IN THE GROUND AND BACKFILLED WITH COMPACTED MATERIAL.
 - SILT FENCE SHOULD BE SECURELY FASTENED TO EACH STEEL SUPPORT POST OR TO WOVEN WIRE, WHICH IS IN TURN ATTACHED TO THE STEEL POST. THERE SHOULD BE A 3-FOOT OVERLAP, SECURELY FASTENED WHERE ENDS OF FABRIC MEET.
 - SILT FENCE SHOULD BE REMOVED WHEN THE SITE IS COMPLETELY STABILIZED SO AS NOT TO BLOCK OR IMPEDE STORM FLOW OR DRAINAGE.
- INSPECTION AND MAINTENANCE GUIDELINES:**
- INSPECT ALL FENCING WEEKLY, AND AFTER ANY RAINFALL.
 - REMOVE SEDIMENT WHEN BUILDUP REACHES 6 INCHES.
 - REPLACE ANY TORN FABRIC OR INSTALL A SECOND LINE OF FENCING PARALLEL TO THE TORN SECTION.
 - REPLACE OR REPAIR ANY SECTION CRUSHED OR COLLAPSED IN THE COURSE OF CONSTRUCTION ACTIVITY. IF A SECTION OF FENCE IS OBSTRUCTING VEHICULAR ACCESS, CONSIDER RELOCATING IT TO A SPOT WHERE IT WILL PROVIDE EQUAL PROTECTION, BUT WILL NOT OBSTRUCT VEHICLES. A TRIANGULAR FILTER DIKE MAY BE PREFERABLE TO A SILT FENCE AT COMMON VEHICLE ACCESS POINTS.
 - WHEN CONSTRUCTION IS COMPLETE, THE SEDIMENT SHOULD BE DISPOSED OF IN A MANNER THAT WILL NOT CAUSE ADDITIONAL SILTATION AND THE PRIOR LOCATION OF THE SILT FENCE SHOULD BE REVEGETATED. THE FENCE ITSELF SHOULD BE DISPOSED OF IN AN APPROVED LANDFILL.



MATCH LINE
SEE SHEET C22



SILT FENCE DETAIL

1

SCALE: NTS

Kimley-Horn and Associates, Inc.
Firm Registration No. 027
601 NW Loop #10 Suite 350, San Antonio, TX 78209-2104-1006
Revised By: [Signature]
Date: [Blank]
ADDENDUM NO. 3

SAN ANTONIO WATER SYSTEM
NACO PUMP STATION IMPROVEMENTS PROJECT
Professional Engineer Seal: [Signature]
V. RYAN SOMA
REGISTERED PROFESSIONAL ENGINEER
91171
02/20/14

GRADING, PAVING & EROSION CONTROL
(4 OF 5)

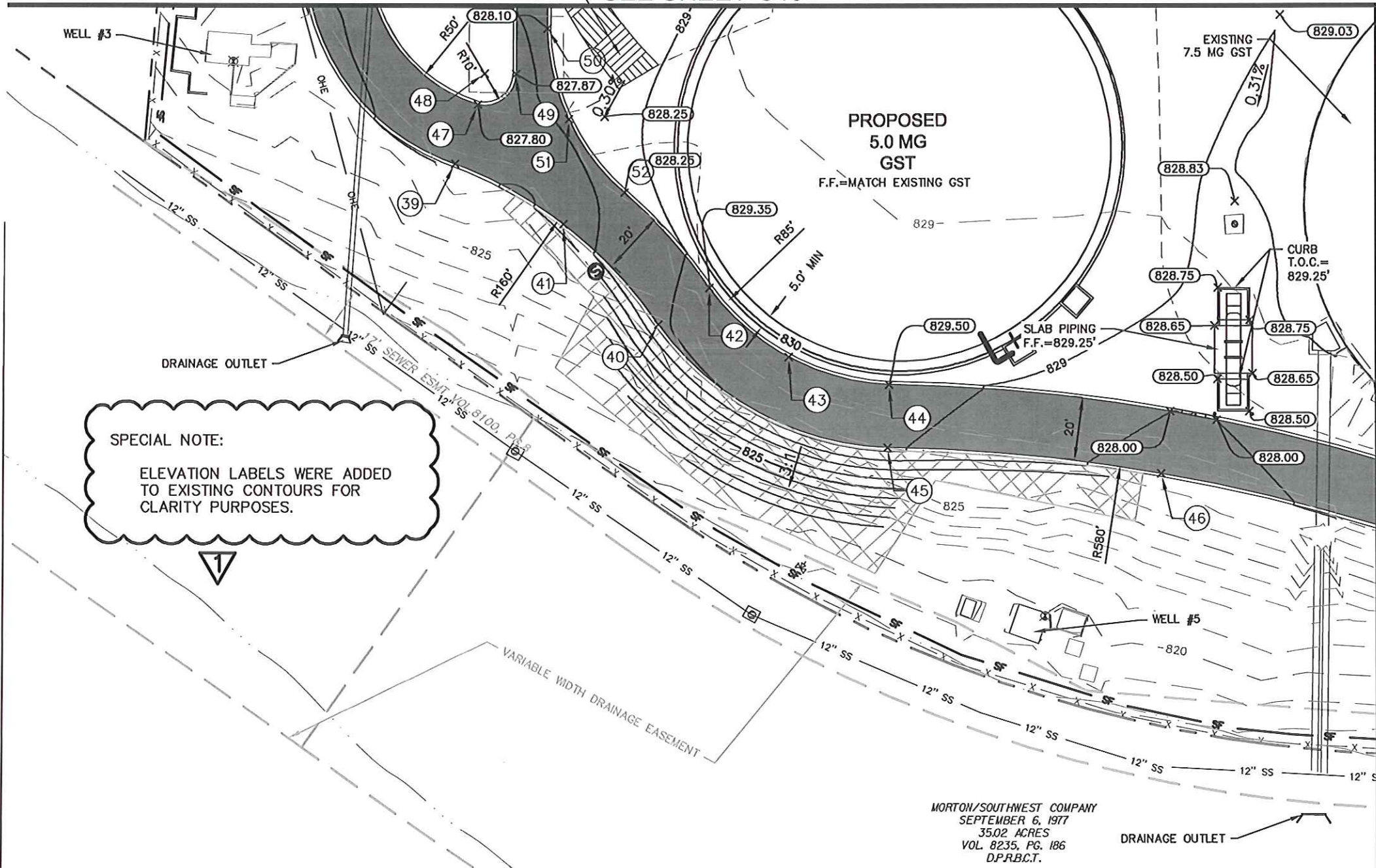
Scale:	AS SHOWN
Designed by:	VRS
Drawn by:	MAY
Checked by:	FCW
Date:	FEBRUARY 2014
Project No.:	068665010
SAWS No.:	12-6003

SHEET
C21

PLOTTED BY: [Blank]
 DWG NAME: [Blank]
 LAST MODIFIED: [Blank]

SEE DETAIL 2 SHEET
C21 FOR TEMPORARY
ROAD

MATCH LINE
SEE SHEET C19



SPECIAL NOTE:
ELEVATION LABELS WERE ADDED
TO EXISTING CONTOURS FOR
CLARITY PURPOSES.

LEGEND

- PROPOSED SILT FENCE
- ROCK BERM
- PROPOSED CONTOURS
- EXISTING CONTOURS
- EROSION CONTROL MATS
- NEW ASPHALT PAVEMENT
- PROPOSED RIBBON CURB
- PROPOSED CONSTRUCTION ENTRANCE

NOTES

1. CONTRACTOR SHALL HYDROMULCH ALL AREAS AFFECTED BY CONSTRUCTION BEFORE FINAL COMPLETION OF PROJECT.
2. STORM WATER POLLUTION PREVENTION PLAN MUST BE SUBMITTED TO THE CITY OF SAN ANTONIO FOR APPROVAL.
3. EROSION CONTROL MUST BE MAINTAINED THROUGHOUT THE ENTIRE PROJECT SITE UNTIL SITE IS STABILIZED. THE CONTRACTOR SHALL INSTALL EROSION CONTROL MATS AND HYDROMULCHING AS NEEDED. SEE NOTES AND TECHNICAL SPECIFICATIONS SHEET C18.
4. CONTRACTOR MUST RAISE FLOWERS INCLUDING BUT NOT LIMITED TO MANHOLES AND WATER APPURTENANCES, TO BE FLUSHED WITH ASPHALT PAVEMENT OR PROPOSED GROUND.
5. CONTRACTOR MUST COMPLY WITH ADA REGULATIONS.
6. ALL EXCAVATION AND EMBANKMENT SHALL BE CONSIDERED INCIDENTAL. NO SEPARATE PAY ITEM.
7. CONTRACTOR SHALL RE-VEGETATE ALL AREAS OF THE SITE DISTURBED BY CONSTRUCTION ACTIVITIES IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS. NO SEPARATE PAY ITEM.
8. ALL SPOT ELEVATIONS ARE TOP OF CONCRETE (TOC) UNLESS OTHERWISE SHOWN ON PLANS.
9. ALL EXISTING RIBBON CURB ADJACENT TO PROPOSED PAVEMENT MUST BE REMOVED AND DISPOSED OF PROPERLY.
10. CONTRACTOR SHALL ENSURE AT LEAST ONE TRAVEL LANE IS OPEN AND ACCESSIBLE FOR SAWS VEHICULAR TRAFFIC BETWEEN NACOGDOCHES ROAD AND THE NORTHEAST SERVICE CENTER.

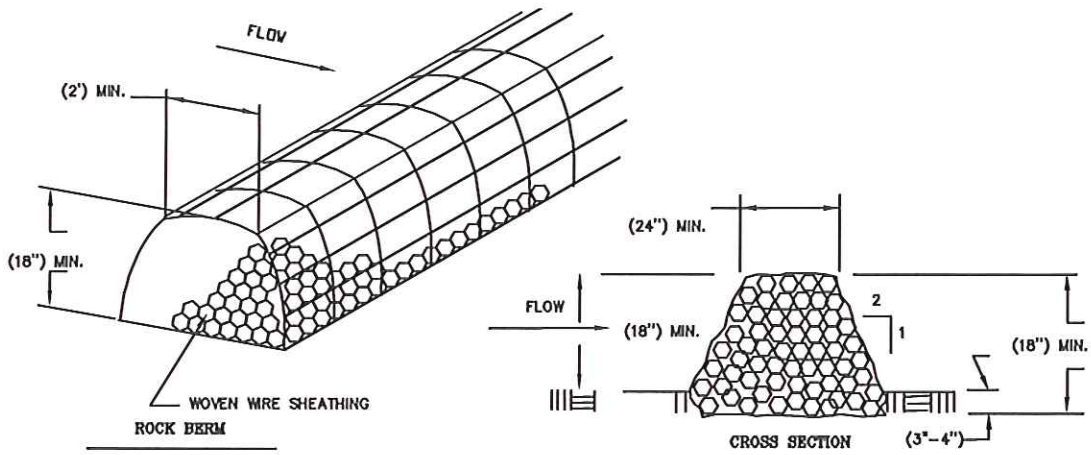
MATCH LINE
SEE SHEET C21

MORTON/SOUTHWEST COMPANY
SEPTEMBER 6, 1977
3502 ACRES
VOL. 8235, PG. 186
D.P.R.B.C.T.

NOTES:

1. USE ONLY OPEN GRADED ROCK 100 TO 200 mm (5 TO 8") DIAMETER FOR STREAM FLOW CONDITIONS. USE OPEN GRADED ROCK 75 TO 125 mm (3 TO 5") DIAMETER FOR OTHER CONDITIONS.
2. THE ROCK BERM SHALL BE SECURED WITH A WOVEN WIRE SHEATHING HAVING MAXIMUM 25mm (1") OPENING AND MINIMUM WIRE DIAMETER OF 12.9 mm (20 GAUGE). ROCK BERMS IN CHANNEL APPLICATIONS SHALL BE ANCHORED FIRMLY INTO THE SUBSTRATE A MINIMUM OF 150mm (6") WITH T-POSTS OR WITH 15M OR 20M (#5 OR #6) REBAR, WITH MAXIMUM SPACING APART OF 1.2 m (48") ON CENTER.
3. THE ROCK BERM SHALL BE INSPECTED WEEKLY OR AFTER EACH RAIN, AND THE STONE AND/OR FABRIC CORE-WOVEN SHEATHING SHALL BE REPLACED WHEN THE STRUCTURE CEASES TO FUNCTION AS INTENDED, DUE TO SILT ACCUMULATION AMONG THE ROCKS, WASHOUT, CONSTRUCTION TRAFFIC DAMAGE, ETC.
4. WHEN SILT REACHES A DEPTH EQUAL TO ONE-THIRD THE HEIGHT OF THE BERM OR 150 mm (6"), WHICHEVER IS LESS, THE SILT SHALL BE REMOVED AND DISPOSED OF ON AN APPROVED SITE AND IN A MANNER THAT WILL NOT CREATE A SILTATION PROBLEM. DAILY INSPECTION SHALL BE MADE ON SEVERE-SERVICE ROCK BERMS; SILT SHALL BE REMOVED WHEN ACCUMULATION REACHES 150 mm (6").
5. WHEN THE SITE IS COMPLETELY STABILIZED, THE BERM AND ACCUMULATED SILT SHALL BE REMOVED AND DISPOSED OF IN AN APPROVED MANNER.

COORDINATE TABLE			
Point #	Northing	Eastng	Description
39	13756188.37	2163980.60	PT OF 138' RADIUS
40	13756087.14	2163994.83	PC OF 138' RADIUS
41	13756131.09	2163993.51	MIDPOINT OF 138' RADIUS
42	13756084.84	2164014.70	PT OF 85' RADIUS
43	13756051.84	2164018.78	MIDPOINT OF 85' RADIUS
44	13756023.85	2164036.72	PC OF 85' RADIUS
45	13756009.40	2164022.89	PT OF 580' RADIUS
46	13755944.74	2164082.21	MIDPOINT OF 580' RADIUS
47	13756177.45	2163998.44	PT OF 10' RADIUS
48	13756183.32	2164006.54	CENTER OF 10' RADIUS
49	13756178.58	2164013.92	PC OF 10' RADIUS
50	13756180.43	2164030.99	PT OF 71' RADIUS
51	13756154.61	2164017.02	MIDPOINT OF 71' RADIUS
52	13756125.33	2164014.68	PC OF 71' RADIUS

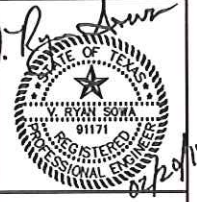


**ROCK BERM
DETAIL**

SCALE: NTS

Kimley-Horn
and Associates, Inc.

Form Registration No. 620
607 NW Loop #10 Suite 500, San Antonio, TX 78209-2704-1010



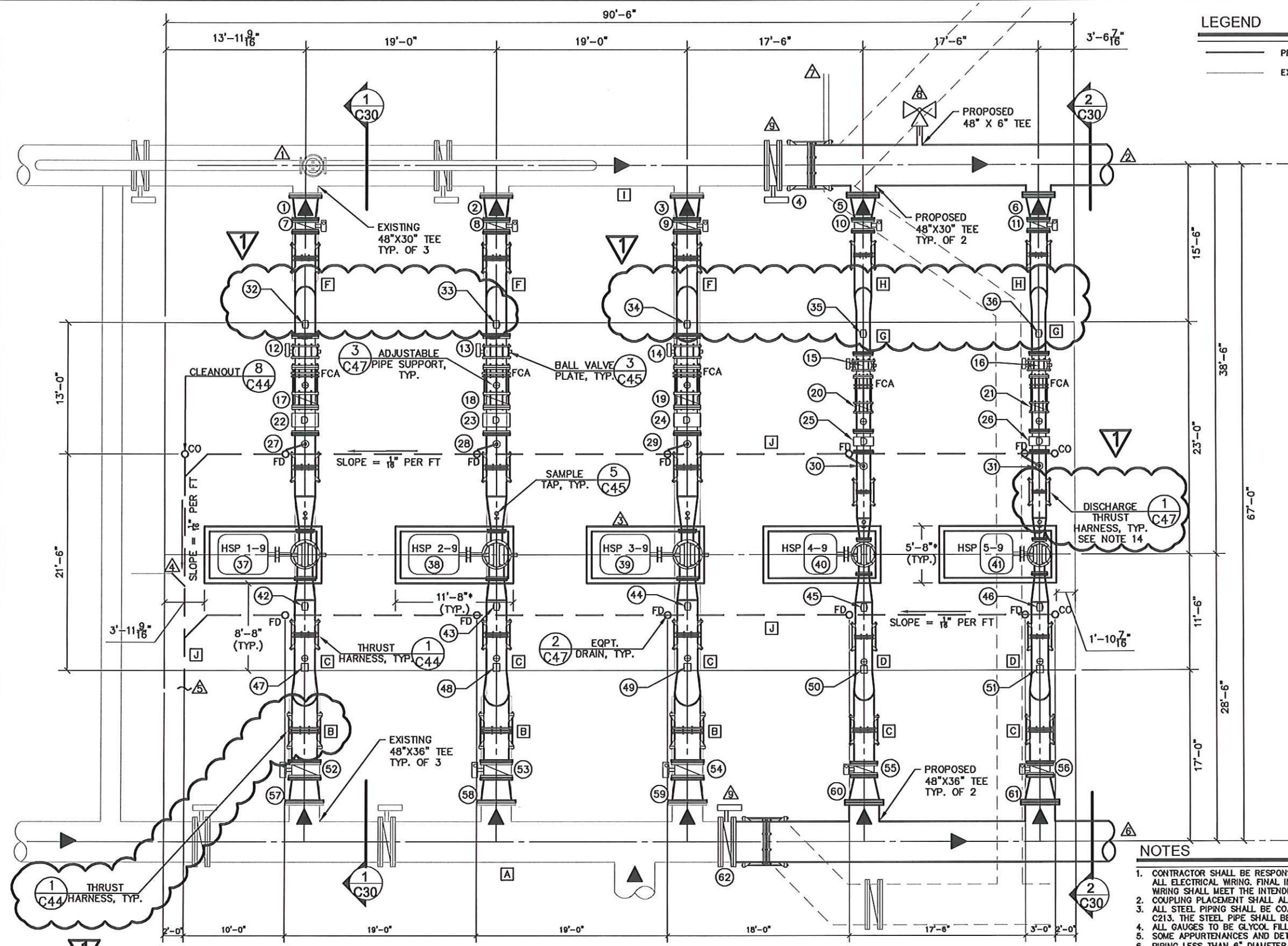
SAN ANTONIO
WATER SYSTEM



GRADING, PAVING &
EROSION CONTROL
(5 OF 5)

AS SHOWN
Designed by: VRS
Drawn by: M/V
Checked by: FCW
Date: FEBRUARY 2014
Project No. 068665010
SAWS No. 12-6003

SHEET
C22



LEGEND

- PROPOSED PIPING
- EXISTING PIPING

BAR IS ONE INCH IN LENGTH ON ORIGINAL DRAWING. CHECK SCALE AND ADJUST ACCORDINGLY.
ONE INCH

NOTES BY SYMBOL

- 1 EXISTING ABOVE GROUND PIPING TO REMAIN NEAR WORKING AREA. USE CAUTION WHEN EXCAVATING AND MOVING EQUIPMENT.
- 2 FOR CONTINUATION OF 48" DISCHARGE HEADER SEE SHEET C24.
- 3 FOR PUMP PAD DETAILS SEE STRUCTURAL SHEETS.
- 4 EXACT LOCATION OF EXISTING 4" DRAIN LINE UNKNOWN. CONTRACTOR TO VERIFY LOCATION AND CONNECT TO PROPOSED 4" DRAIN LINE WITH 4" WYE.
- 5 FOR CONTINUATION OF 4" DRAIN LINE SEE SHEET C23.
- 6 FOR CONTINUATION OF 48" SUCTION HEADER SEE SHEET C24.
- 7 FIRE HYDRANT AND PIPING TO BE RELOCATED. SEE WATER PIPING PLAN SHEET C24 FOR LOCATION.
- 8 PROPOSED FIRE HYDRANT WITH ISOLATION VALVE. SEE DETAIL 4, SHEET C44.
- 9 REMOVAL OF EXISTING BUTTERFLY VALVES AND THRUST BLOCKING TO BE REPLACED WITH PROPOSED BUTTERFLY VALVE AND THRUST BLOCKING SHALL BE CONSIDERED SUBSIDIARY TO THE COST OF THE PROJECT (NO SEPARATE PAY ITEM)

EQPT & VALVE BY SYMBOL

1	RED-501	22	FM-522	43	PG-543
2	RED-502	23	FM-523	44	PG-544
3	RED-503	24	FM-524	45	PG-545
4	BFV-504	25	FM-525	46	PG-546
5	RED-505	26	FM-526	47	LWC-547
6	RED-506	27	CAV-527	48	LWC-548
7	BFV-507	28	CAV-528	49	LWC-549
8	BFV-508	29	CAV-529	50	LWC-550
9	BFV-509	30	CAV-530	51	LWC-551
10	BFV-510	31	CAV-531	52	BFV-552
11	BFV-511	32	PG-532	53	BFV-553
12	BV-512	33	PG-533	54	BFV-554
13	BV-513	34	PG-534	55	BFV-555
14	BV-514	35	PG-535	56	BFV-556
15	BV-515	36	PG-536	57	RED-557
16	BV-516	37	HSP 1-9	58	RED-558
17	CV-517	38	HSP 2-9	59	RED-559
18	CV-518	39	HSP 3-9	60	RED-560
19	CV-519	40	HSP 4-9	61	RED-561
20	CV-520	41	HSP 5-9	62	BFV-562
21	CV-521	42	PG-542		

PIPING BY SYMBOL

A	48" STEEL SUCTION HEADER
B	30" STEEL SUCTION PIPING
C	24" STEEL SUCTION PIPING
D	20" STEEL SUCTION PIPING
E	16" STEEL SUCTION PIPING
F	24" STEEL DISCHARGE PIPING
G	16" STEEL DISCHARGE PIPING
H	20" STEEL DISCHARGE PIPING
I	48" STEEL DISCHARGE HEADER
J	4" PVC DRAIN LINE

NOTES

1. CONTRACTOR SHALL BE RESPONSIBLE FOR BUT NOT LIMITED TO FURNISHING AND INSTALLING PIPING AND ALL ELECTRICAL WIRING. FINAL INSTALLATION OF COMPLETE PUMPING SYSTEM, PIPING AND ELECTRICAL WIRING SHALL MEET THE INTENDED OPERATION OF THE PUMP INSTALLATION.
2. COUPLING PLACEMENT SHALL ALLOW CLEARANCE OF 2 TIMES THE ROD LENGTH FOR REMOVAL PROCESS.
3. ALL STEEL PIPING SHALL BE COATED AND LINED WITH A FUSION BONDED EPOXY COATING PER AWWA C213. THE STEEL PIPE SHALL BE PAINTED PER THE PROJECT SPECIFICATIONS.
4. ALL GAUGES TO BE GLYCOL FILLED.
5. SOME APPURTENANCES AND DETAILS ARE OMITTED FOR CLARITY.
6. PIPING LESS THAN 6" DIAMETER, ROUTING IS SHOWN IN GENERAL ONLY. CONTRACTOR SHALL VERIFY EXACT INSTALLATION ARRANGEMENT WITH OWNER'S ON-SITE REPRESENTATIVE PRIOR TO INSTALLATION.
7. PIPING 4" IN DIAMETER AND SMALLER, FURNISH AND INSTALL UNIONS, BUSHINGS, COUPLINGS AND OTHER FITTINGS FOR EASE OF INSTALLATION AND MAINTENANCE OF VALVES AND EQUIPMENT. CONTRACTOR SHALL VERIFY EXACT INSTALLATION ARRANGEMENT WITH OWNER'S ON-SITE REPRESENTATIVE PRIOR TO INSTALLATION.
8. REFER TO STRUCTURAL SHEETS FOR PUMP STATION FOUNDATION PLAN AND SECTIONS.
9. REFER TO ELECTRICAL SHEETS FOR MORE INFORMATION REGARDING WIRING, POWER, COMMUNICATION AND CONTROLS.
10. SMALL DIAMETER TUBING, PIPING AND APPURTENANCES SHALL BE HEAT TRACED.
11. REFER TO ELECTRICAL SHEETS FOR HEAT TRACING SCHEMATICS FOR THE PUMPS.
12. ALL BURIED THRUST HARNESSSES TO BE PACKED WITH DENSO PASTE AND WRAPPED WITH PETROLEUM TAPE.
13. CONTRACTOR SHALL VERIFY ALL PIPING DIMENSIONS IN THE FIELD PRIOR TO PROJECT LAYOUT AND STEEL PIPE SHOP DRAWING SUBMITTAL AND FABRICATION. IT IS THE CONTRACTOR'S RESPONSIBILITY TO ENSURE ALL FLOOR DRAINS, ELECTRICAL STUBOUTS, AND STRUCTURAL PADS ARE ADJUSTED APPROPRIATELY TO ANY PIPE LOCATION CHANGE.
14. ALL HARNESSSED COUPLINGS DIRECTLY ADJACENT TO EACH PUMP ON THE DISCHARGE PIPING SHALL BE CONSTRUCTED IN ACCORDANCE WITH DETAIL 1, SHEET C47. ALL OTHER HARNESSSED COUPLINGS SHALL BE CONSTRUCTED IN ACCORDANCE WITH DETAIL 1, SHEET C44.

SERVICE LEVEL 9 PIPING PLAN

SCALE: 3/32" = 1' (11" X 17")

* FOR ACTUAL BASE PLATE DIMENSIONS REFER TO EQUIPMENT SUPPLIER SHOP DRAWINGS.

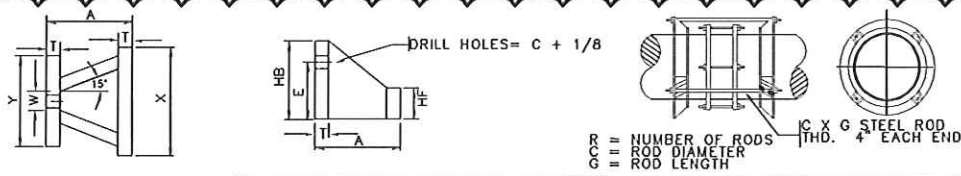
Kimley-Horn and Associates, Inc.
1201 NW Loop 110 Suite 300, San Antonio, TX 78207-2704-1916
Rev. 10/11
ADDENDUM NO. 3

SAN ANTONIO WATER SYSTEM
NACO PUMP STATION IMPROVEMENTS PROJECT

SERVICE LEVEL 9 PUMP STATION PUMP STATION PLAN VIEW

Scale: AS SHOWN
Designed by: VRS
Drawn by: JIS
Checked by: FCW
Date: FEBRUARY 2014
Project No.: 068665010
SAWS No.: 12-6003

SHEET
C29



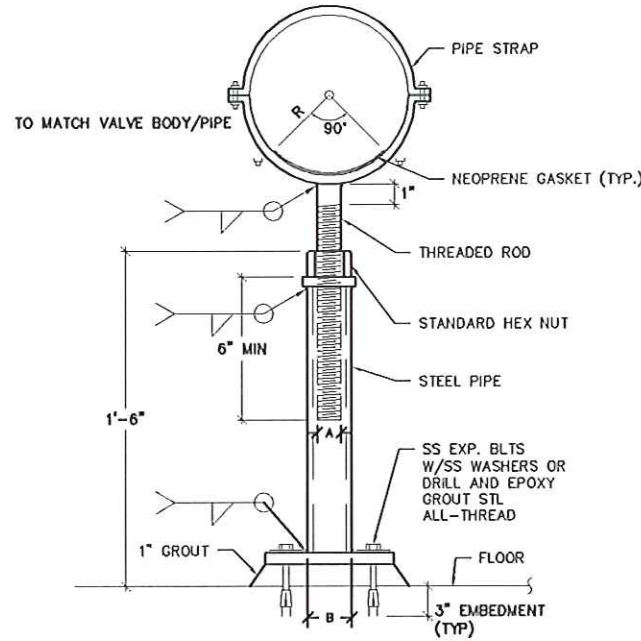
PIPE SIZE & TYPE	FLANGED COUPLING HARNESS STEEL PIPE DIMENSION SCHEDULE (INCHES)											
	A	C+1/8	C	E	G	HB	HF	R	T	W	X	Y
16" STL (250 PSI)	12	1.875	1.75	4	34	5.875	2.5	6	.875	2.5	RING	RING
24" STL (250 PSI)	12	1.875	1.75	4	35	5.875	2.5	8	.875	2.5	RING	RING

NOTE: ALL COUPLINGS TO HAVE A MINIMUM GAP OF 1" AND MAXIMUM GAP OF 2".

DISCHARGE PIPING COUPLING HARNESS DETAIL

1

SCALE: NTS

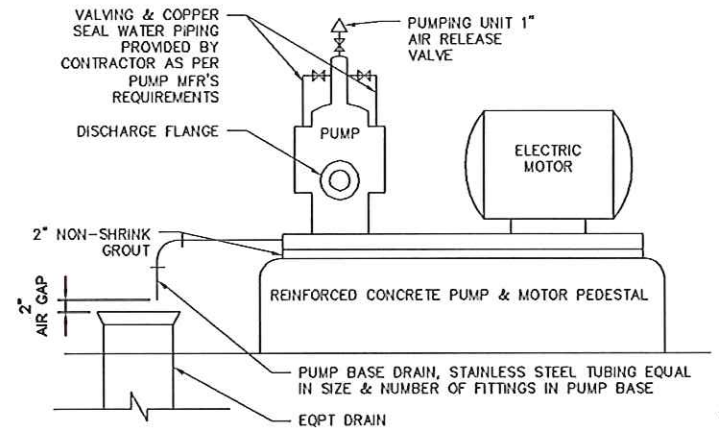


ADJUSTABLE PIPE SUPPORT DIMENSIONS		
PIPE SIZE	PIPE SUPPORT SIZE (A)	PIPE ADJUSTER SIZE (B)
12"	2"	1-1/2"
16"	3"	2"
24"	3"	2"
30"	6"	3"
36"	6"	3"
42"	6"	3"
54"	6"	3"

ADJUSTABLE PIPE SUPPORT WITH STRAP DETAIL

3

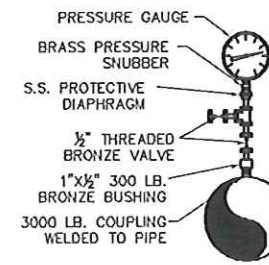
SCALE: NTS



PUMPING UNIT ACCESSORY PIPING DETAIL

4

SCALE: NTS

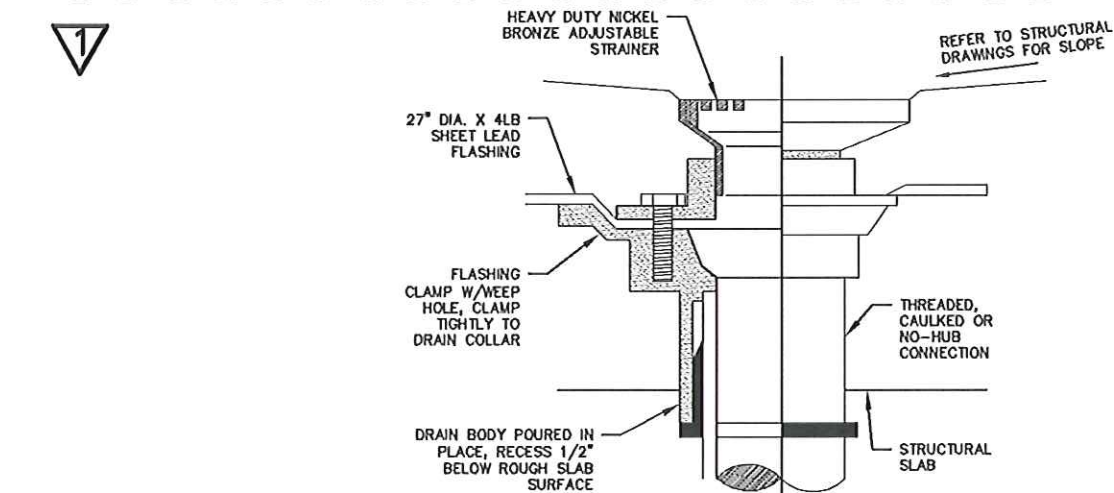


- NOTES:
- PRESSURE GAUGES SHALL HAVE 4-INCH DIAMETER FACES AND BE CALIBRATED FROM 0 TO 150 PSI.
 - GAUGE SHALL BE FILLED WITH GLYCOL AND INSTALLED WITH A PRESSURE SNUBBER AND SHALL BE OF STAINLESS STEEL CONSTRUCTION.
 - INSTALL GAUGE WITH A 0.25-INCH NPT CONNECTION AND INCLUDE A CORPORATION STOP AND AIR BLEED.
 - VALVES TO BE RATED AT 200 PSI MIN.
 - ALL WELDED COUPLINGS SHALL BE RATED FOR 3000 LBS.
 - GAUGE SHALL BE TRERICE MANUFACTURED OR APPROVED EQUAL.

PIPE PRESSURE GAUGE DETAIL

5

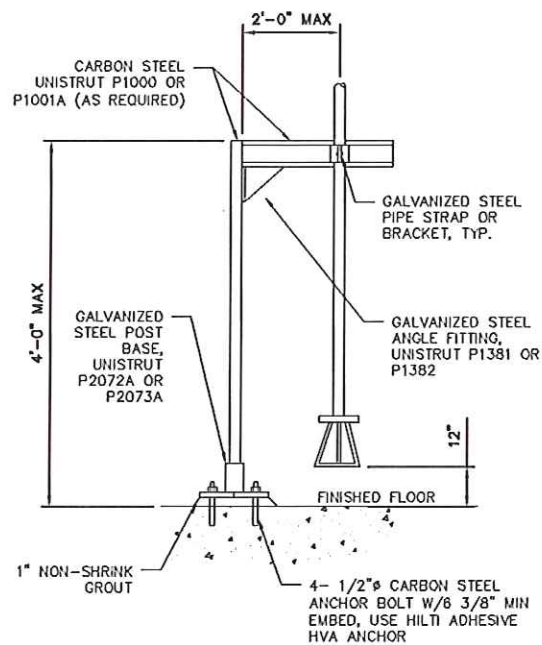
SCALE: NTS



FLOOR DRAIN DETAIL

2

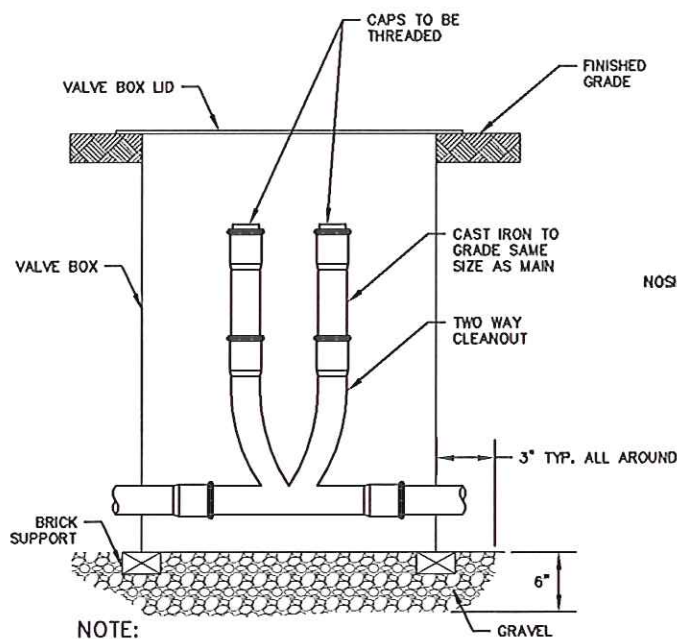
SCALE: NTS



PIPE SUPPORT FOR ARV DETAIL

6

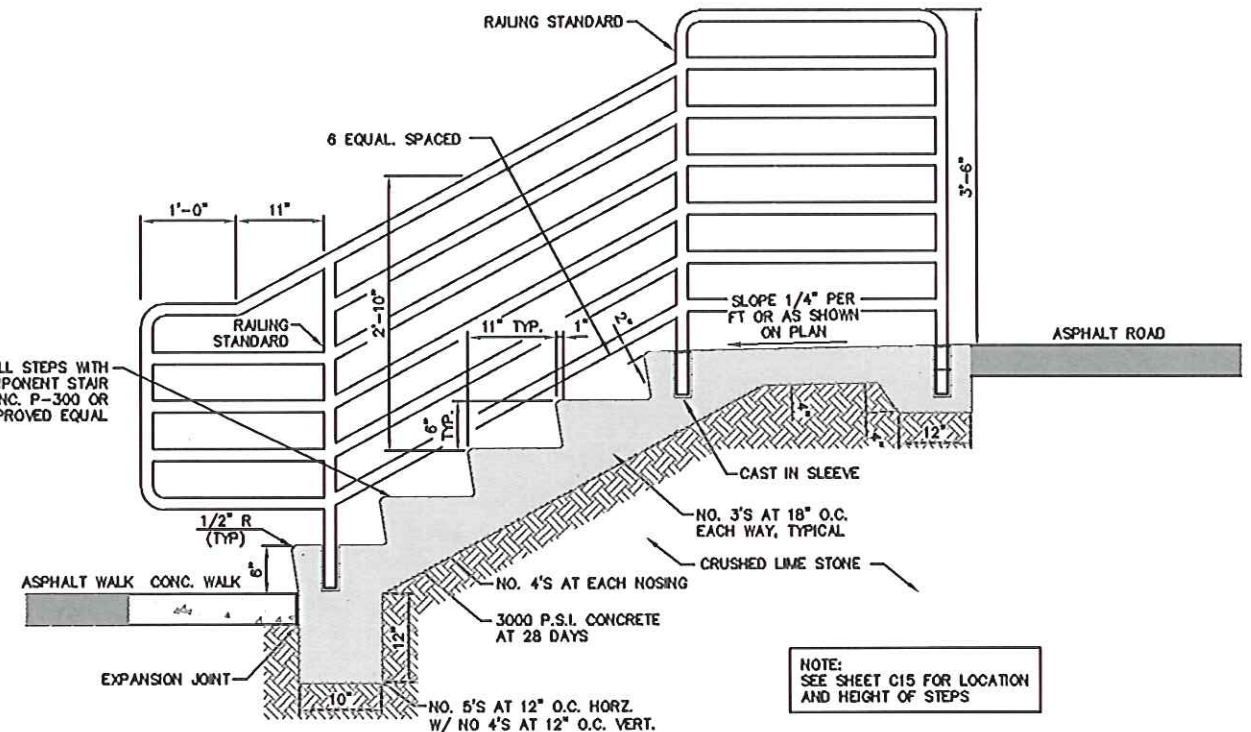
SCALE: NTS



DOUBLE WYE CLEANOUT DETAIL

7

SCALE: NTS



STAIR AND HAND RAIL DETAIL

8

SCALE: NTS

DESIGNED BY: VRS
 DRAWN BY: MAY
 CHECKED BY: FCW
 DATE: FEBRUARY 2014
 PROJECT NO. 068665010
 SAWS NO. 12-6003

Kimley-Horn
and Associates, Inc.
 Form Registration No. 008
 601 NW Loop #10 Suite 300, San Antonio, TX 78208-2704-10108

Professional Engineer
 State of Texas
 No. 12345
 Exp. 12/31/14
 ADDENDUM NO. 3
 Revision
 By: [Signature]
 Date: 04/20/14

SAN ANTONIO
WATER SYSTEM
 NACO PUMP STATION
IMPROVEMENTS PROJECT

MISCELLANEOUS
DETAILS (6 OF 6)

Scale: AS SHOWN
 Designed by: VRS
 Drawn by: MAY
 Checked by: FCW
 Date: FEBRUARY 2014
 Project No. 068665010
 SAWS No. 12-6003

SHEET
C47

LOAD ANALYSIS							
BUS "A"			BUS "B"				
	HP	FLA	kVA		HP	FLA	kVA
HSP-1-6 FV	500	65.5	500	HSP 3-6 FV	500	65.5	500
HSP 2-6 FV	500	65.5	500	HSP 4-6 FV	500	65.5	500
HSP 5-6 FV	500	70	500	HSP 3-5 FV	200	50	200
HSP 1-5 FV	200	50	200	HSP 4-5 FV	400	75	400
HSP 2-5 FV	400	75	400	HSP 1-9 RVSS	800	112	800
HSP 3-9 RVSS	800	112	800	HSP 2-9 RVSS	800	112	800
HSP 5-9 RVSS	400	56	400	HSP 4-9 RVSS	400	56	400
WP-1 FV	600	72	600	WP-2 FV	600	89	600
WP-3 FV	600	89	600	WP-4 FV	300	42	300
WP-5 FV	500	66	500	WP-6 ATSS	900	119	900
WP-7 ATSS	900	119	900	XFMR-B	N/A	11	75
XFMR-A	N/A	11	75	XFMR-E	N/A	70	500
XFMR-C	N/A	70	500	TOTAL:	5,400	867	5,975
TOTAL:	5,900	921	6,475				

FV - FULL VOLTAGE STARTER (ACROSS-THE-LINE)
 ATSS - AUTO-TRANSFORMER SOFT STARTER (65% TAP)
 RVSS - REDUCED VOLTAGE SOFT STARTER

TOTAL PROPOSED CONNECTED LOAD: 12,450 KVA
 1,788 AMPS
 TOTAL PROPOSED DEMAND LOAD: 9,523 KVA
 1,333 AMPS

NOTE: ALL EXISTING POWER FACTOR CORRECTION CAPACITORS SHALL BE REMOVED FROM ALL HIGH SERVICE PUMPS AND WELL PUMPS.

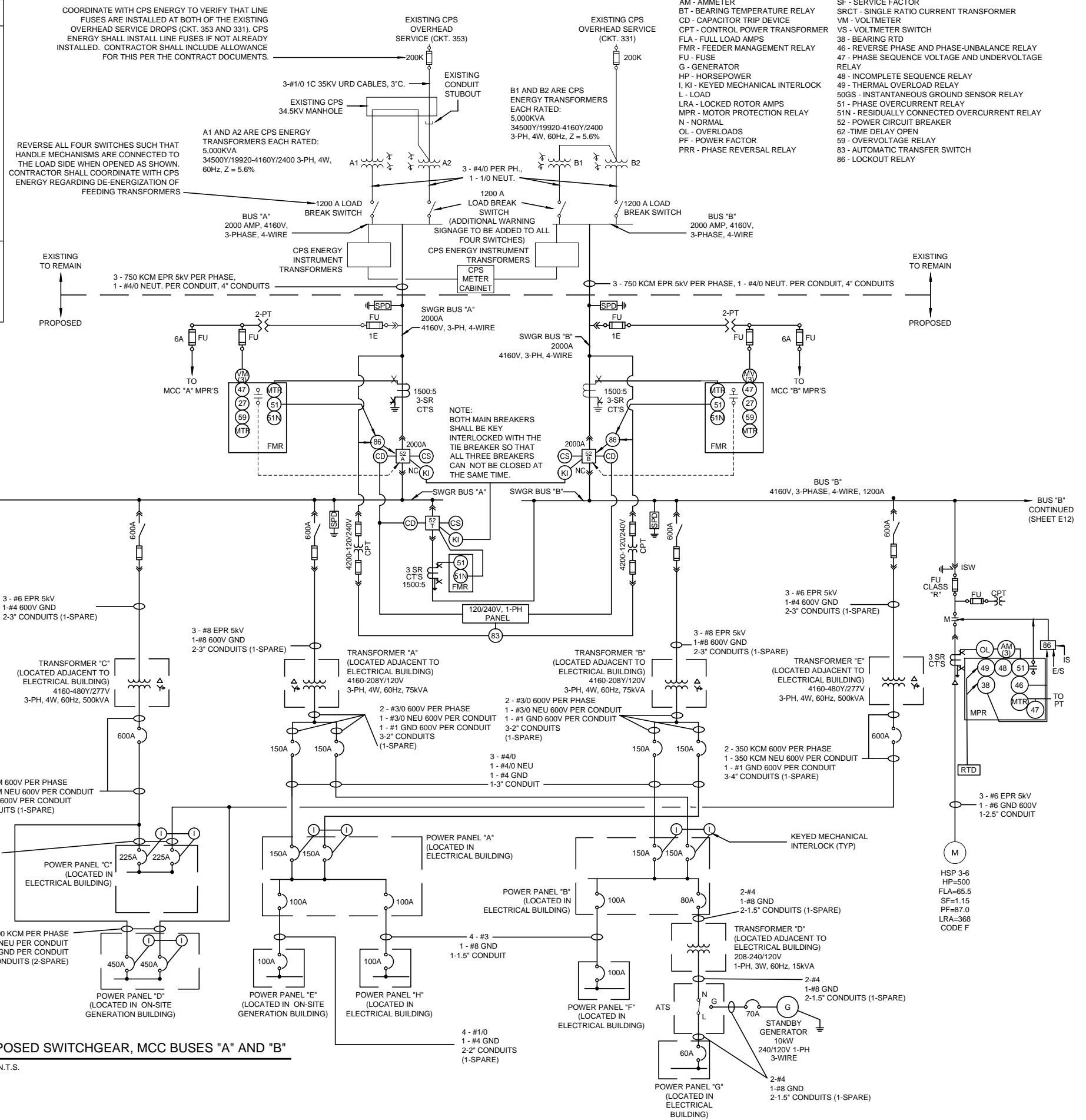
DEVICE LEGEND

- AS - AMMETER SWITCH
- ATS - AUTOMATIC TRANSFER SWITCH
- AM - AMMETER
- BT - BEARING TEMPERATURE RELAY
- CD - CAPACITOR TRIP DEVICE
- CPT - CONTROL POWER TRANSFORMER
- FLA - FULL LOAD AMPS
- FMR - FEEDER MANAGEMENT RELAY
- FU - FUSE
- G - GENERATOR
- HP - HORSEPOWER
- I, KI - KEYED MECHANICAL INTERLOCK
- L - LOAD
- LRA - LOCKED ROTOR AMPS
- OL - OVERLOADS
- PF - POWER FACTOR
- PRR - PHASE REVERSAL RELAY
- PT - POTENTIAL TRANSFORMER
- SPD - SURGE PROTECTIVE DEVICE
- SF - SERVICE FACTOR
- SRCT - SINGLE RATIO CURRENT TRANSFORMER
- VM - VOLTMETER
- VS - VOLTMETER SWITCH
- 38 - BEARING RTD
- 46 - REVERSE PHASE AND PHASE-UNBALANCE RELAY
- 47 - PHASE SEQUENCE VOLTAGE AND UNDERVOLTAGE RELAY
- 48 - INCOMPLETE SEQUENCE RELAY
- 49 - THERMAL OVERLOAD RELAY
- 50GS - INSTANTANEOUS GROUND SENSOR RELAY
- 51 - PHASE OVERCURRENT RELAY
- 51N - RESIDUALLY CONNECTED OVERCURRENT RELAY
- 52 - POWER CIRCUIT BREAKER
- 62 - TIME DELAY OPEN
- 59 - OVERVOLTAGE RELAY
- 83 - AUTOMATIC TRANSFER SWITCH
- 86 - LOCKOUT RELAY

COORDINATE WITH CPS ENERGY TO VERIFY THAT LINE FUSES ARE INSTALLED AT BOTH OF THE EXISTING OVERHEAD SERVICE DROPS (CKT. 353 AND 331). CPS ENERGY SHALL INSTALL LINE FUSES IF NOT ALREADY INSTALLED. CONTRACTOR SHALL INCLUDE ALLOWANCE FOR THIS PER THE CONTRACT DOCUMENTS.

REVERSE ALL FOUR SWITCHES SUCH THAT HANDLE MECHANISMS ARE CONNECTED TO THE LOAD SIDE WHEN OPENED AS SHOWN. CONTRACTOR SHALL COORDINATE WITH CPS ENERGY REGARDING DE-ENERGIZATION OF FEEDING TRANSFORMERS

EXISTING TO REMAIN
 PROPOSED



PROPOSED SWITCHGEAR, MCC BUSES "A" AND "B"
 SCALE: N.T.S.

GRUBB ENGINEERING, INC.
 ELECTRICAL POWER SYSTEMS
 DESIGN AND TESTING
 TYPE FIRM REGISTRATION NO. 3904

MARK	DATE	REVISION	BY
A	2/20/14	REVISION BY ADDENDUM #3	SM

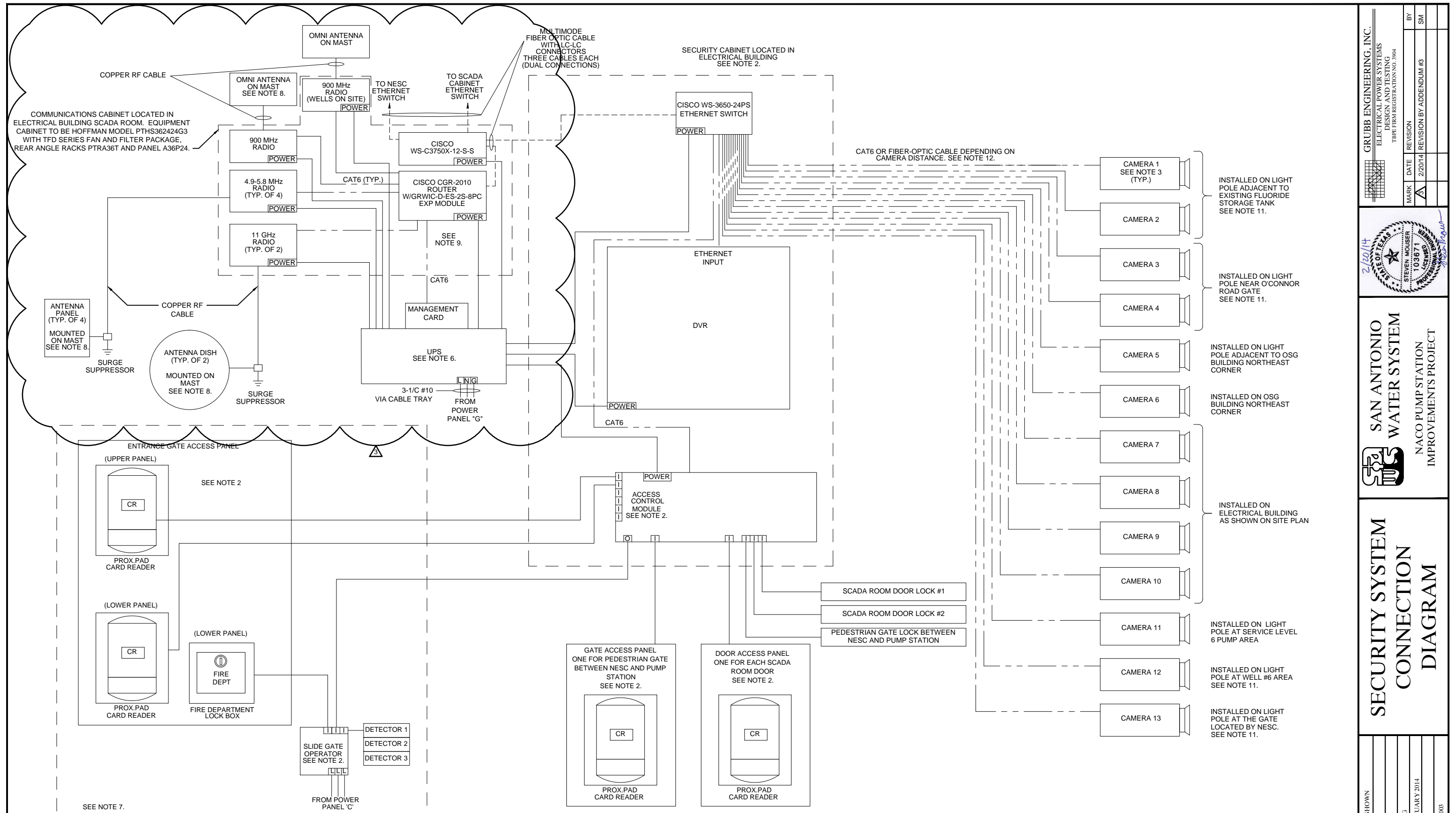


SAN ANTONIO WATER SYSTEM
 NACO PUMP STATION IMPROVEMENTS PROJECT

PROPOSED ONE-LINE DIAGRAM - PART 1

Scale: AS SHOWN
 Designed by: SM
 Drawn by: SG
 Checked by: RDG
 Date: JANUARY 2014
 Project No. 12-6003
 SAWS No.

LAST SAVED 2/18/2014 2:29 PM



A SECURITY SYSTEM DIAGRAM
SCALE: NOT TO SCALE

- NOTES:
1. SURGE ARRESTORS TO BE PROVIDED BY CONTRACTOR FOR CAT6 CABLE. MANUFACTURER SHALL BE PHOENIX CONTACT OR EQUAL.
 2. SEE SPECIFICATION 16722 FOR EQUIPMENT DETAILS.
 3. MOUNT CAMERAS AS SHOWN ON SITE PLAN. ALL CAMERAS ARE FIXED VIEW UNLESS OTHERWISE NOTED.
 4. CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING AND INSTALLING MOTION SENSORS FOR ALL CAMERAS. SENSORS ARE NOT SHOWN ON THIS DIAGRAM.
 5. CONTRACTOR SHALL BE RESPONSIBLE FOR ROUTING SECURITY CABLE AND CONDUIT FROM THE SECURITY EQUIPMENT TO SECURITY PANEL.
 6. UPS IS A STANDALONE UNIT. UPS SHALL BE APC SMART UPS MODEL SYAK8P OR SIMILAR BY APC. PROVIDE EXTENDED RUNTIME MODULES AS NECESSARY TO ALLOW FOR 2 HOUR RUNTIME AT FULL SYSTEM LOAD. ALSO PROVIDE APC UPS NETWORK MANAGEMENT CARD V2 MODEL AP9630, OR SIMILAR.
 7. ALL EQUIPMENT AS SHOWN IN SELECTED AREA SHALL BE PROVIDED FOR TWO ENTRANCES - ONE AT O'CONNOR ROAD AND ONE AT NACOGDOCHES ROAD.
 8. REFER TO SPECIFICATION 17600 FOR ANTENNA MAST DETAILS. SAWS SHALL PROVIDE ANTENNA AZIMUTHS.
 9. REFER TO SPECIFICATION 17515 FOR COMMUNICATIONS EQUIPMENT DETAILS.
 10. CONTRACTOR SHALL PROVIDE AND INSTALL FIBER-OPTIC CONVERTER EQUIPMENT AS NEEDED. THIS EQUIPMENT IS NOT SHOWN.
 11. CONTRACTOR TO ROUTE CABLE THROUGH PATCH-PANEL ON SECURITY RACK PER SPECIFICATION 16722.
 12. CAMERAS ROUTED THROUGH PATCH PANEL WILL HAVE FIBER OPTIC CABLE FROM THE SECURITY CABINET TO TO THE PATCH PANEL. FROM PATCH PANEL TO CAMERA THE CABLE WILL BE CAT6. THE CAMERAS NOT CONNECTED TO THE PATCH PANEL WILL HAVE CAT6 CABLE DIRECT FROM THE SECURITY PANEL.

GRUBB ENGINEERING, INC.			
ELECTRICAL POWER SYSTEMS			
DESIGN AND TESTING			
TYPE FIRM REGISTRATION NO. 3904			
MARK	DATE	REVISION	BY
A	2/20/14	REVISION BY ADDENDUM #3	SM



SAN ANTONIO WATER SYSTEM
NACO PUMP STATION IMPROVEMENTS PROJECT

SECURITY SYSTEM CONNECTION DIAGRAM

Scale:	AS SHOWN
Designed by:	SM
Drawn by:	SG
Checked by:	RDG
Date:	JANUARY 2014
Project No.:	12-6003
SA WS No.:	